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ABSTRACT

An evaluation of alternative methods--including three types of questionnaires and face-to-face interviews--of obtaining post training feedback from naval personnel is described. Using a sample of recent radio technician trainees, various approaches to data collection were employed. It was found that questionnaires provide the most cost-effective means of obtaining the needed information. Recommendations for further development and implementation of the questionnaire procedures are presented. The appendixes include the data collection instruments used, interview instructions, and summary data sheets. (DGC)

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TAEG REPORT
NO. 19

A METHOD FOR OBTAINING POST FORMAL TRAINING FEEDBACK: DEVELOPMENT AND VALIDATION

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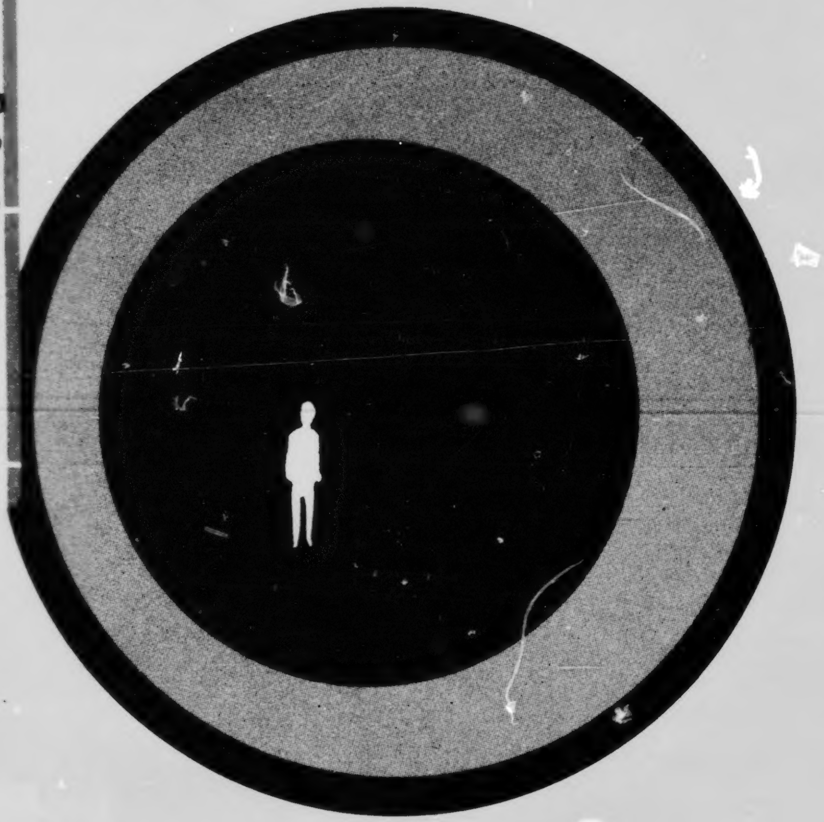

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This report presents a cost-effective method to be used by Navy schools to obtain feedback information from operational units regarding the adequacy of formal school training. Continuing application of this method will also identify the need for training modifications to meet changing operational requirements. The method was established to be valid and also equivalent to personal interviews in an extensive experiment in which several feedback instruments and a number of procedures for their administration were compared. The experiment is described in this report and the results are presented and discussed. The quality of the data provided by this feedback method led to the recommendation that it be adopted for use throughout the Navy training system. Instructions for implementing this recommendation are also presented in this report. A companion report (TAEG Feedback Manual, June, 1975) also provides detailed instructions for using this feedback method. The companion report is written for the relatively unsophisticated training personnel who will be primarily responsible for obtaining feedback data from operational units and for using the information to correct training problems.

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Training Analysis and Evaluation Group

May 1975

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SYNOPSIS

The objective of this study was the development and validation of an effective method for obtaining post formal training feedback information suitable for use throughout the Navy training system. The continuous collection of this information from operational units concerning the job performance of school graduates is vital for maintaining up-to-date, effective training programs. Although a number of unrelated approaches for obtaining post formal training feedback exist in different Navy schools, there is no standard, systematic method for obtaining such data. To fill this gap in the evaluation of training programs, the Chief of Naval Education and Training (CNET), N-34, assigned to the Training Analysis and Evaluation Group (TAEG) the task of developing such a method.

A preliminary examination of existing feedback techniques indicated that the mail-out questionnaire and the personal interview were the general approaches most suitable for this purpose. The questionnaire method has the potential for inexpensively providing reliable data from the widest possible range of operational units. However, low return rates and data of poor quality have been the more typical results when this feedback method has been used by Navy schools. Prior to selection and development of a feedback method for Navy-wide use, it was essential to resolve many questions about the effectiveness of mail-out feedback methods and to compare their performance with that of more highly esteemed personal interviews. To do this, an empirical comparison of mail-out and personal interview feedback methods was undertaken in a military training setting where many training problems had already been identified. Different feedback methods could thus be easily compared on the accuracy with which they disclosed these known training problems.

The Radioman "A" School was selected for this development and comparison of feedback methods. The school had recently undergone a major curriculum revision based on a job task analysis. The new curriculum had not yet been implemented and the many training problems identified in the old curriculum would serve to measure the effectiveness of the different feedback methods. In addition, the large number of graduates produced by the school provided the study team with the opportunity to test a number of different mail-out instruments and administration techniques.

Questionnaires were mailed to 996 recent Radioman "A" School graduates and 590 supervisors of such graduates. The names and locations of these personnel had been confirmed by letters returned from the operational units prior to questionnaire mailing. Three different questionnaire formats were evaluated. The first was a long form (134 items) made up of specific training and job task statements. The second was a short form (15 items) made from a list of general job task statements that subsumed the specific job tasks of the long form. On both forms, the respondent was asked to rate (1) the frequency with which the trainee performed the task, (2) the criticality of the task, and (3) how well the trainee could perform the task upon arrival at the operational unit. The third instrument was a card-sorting technique in which the 134 items from the long questionnaire were printed on small cards to be sorted by the respondent into categories related to task frequency and to the trainee's ability to perform the task. In addition to mail-out procedures, a group of 59 trainees and 37 supervisors were interviewed face-to-face using a structured interview based on the long questionnaire.

The data obtained by each method were analyzed for the accuracy and comprehensiveness with which the rating scale data identified the known training problems that had existed for the graduates. Return rate statistics were also computed for the different mail-out instruments as well as statistics on time until instrument return. Separate analyses on these variables were conducted for (1) trainees and supervisors, (2) persons who expected the questionnaire and persons who did not, (3) graduates with different times from graduation prior to evaluation, (4) graduates with different class standings, and (5) graduates with different duty stations. The last variable was investigated because many of the problems of the old Radioman "A" School curriculum were related to the inappropriate training on shipboard systems given to persons assigned to shore stations.

All of the instruments and procedures included in the study were at least moderately successful in identifying the known training problems as well as identifying successful training. The long questionnaire based on specific job task statements was particularly effective and provided data that were nearly identical to the data obtained from the personal interview method. These data were highly reliable (i.e., consistent from one respondent to another), and they accurately and comprehensively identified the shortcomings known to exist in the old Radioman "A" School curriculum. Supervisory personnel provided somewhat better quality information than trainees, although both were excellent sources of data about training problems and both should be called on to provide feedback information.

The overall rate of return for instruments was satisfactory to meet training needs. The rate of return was 59 percent for supervisors and 31 percent for trainees. The return rate for short form questionnaires was significantly greater than for the long form with most of the difference between the instruments contributed by the trainees. Despite a higher rate of return, the short form failed to identify many specific training problems that were disclosed by the long questionnaire.

An expectation or "set" to receive the mail-out instrument was found to significantly improve the return rate of trainees. Such a "set" should be established in the graduate, either as it was done in this study by preceding the questionnaire with a letter or by contacting him prior to his departure from school. The optimal time lapse between graduation and administration of the feedback instrument was determined to be five to seven months.

Because of the excellent results obtained in this study with the questionnaire based on specific job tasks, it is recommended that the CNET adopt this particular instrument format and associated procedures as the major method for obtaining post formal training feedback information in Navy schools. The recommended feedback/curriculum revision cycle takes 18 months plus the duration of the course. A minimum number of personnel are required to develop and administer the instruments and to analyze the data. Procedures are straightforward and require no particular training of the person or persons assigned to carry them out. These procedures are also described in a companion report (TAEG "Feedback Manual," June 1975) written specifically for the training personnel who will be primarily responsible for implementing them.

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SECTION I

INTRODUCTION

A training program is effective only to the extent that it meets the needs of the Fleet and other operational units for qualified personnel. These needs must be given the highest priority in the design of training programs and also in the assessment of these programs. Course design based on job task analysis meets this criterion, and procedures already exist for this purpose (Butler, 1972; Branson, 1974; Rundquist, 1970; Smith, 1971). However there is a gap in the evaluation of training programs since standard and systematic procedures do not exist for providing schools with job performance data on their graduates. Such data is needed (1) to correct the errors that inevitably result even with proper course design and (2) to update courses in the face of changing job requirements. To fill this gap, the Chief of Naval Education and Training (CNET), N-34, assigned to the Training Analysis and Evaluation Group (TAEG) the task of developing a feedback method which would systematically and cost effectively provide Navy schools with critical information from operational units about training outcomes. To achieve this task, an extensive study of training feedback methodology was conducted by a three-person team during the period from November 1973 to March 1975.

OBJECTIVES OF THE STUDY

This study was undertaken to accomplish the following objectives:

1. To determine the utility of existing training feedback methods, particularly those which utilize inexpensive mail-out procedures.

2. To develop an instrument for Navy training feedback, procedures for its administration, and procedures for utilization of the data it provides.

3. To establish the effectiveness and cost of the selected feedback method.

4. To provide a manual that will enable relatively unsophisticated personnel in Navy schools to construct and administer the instrument and to use the data provided.

BACKGROUND

Much of the impetus for this project stemmed from a study by Peters and Chambers (1964) of Navy training feedback methods and requirements. The report identified many problems that existed in the evaluation of Navy training programs ranging from the general lack of awareness of the importance of training feedback to the absence of specific forms and procedures for obtaining feedback information. A series of recommendations was provided for improvement of the Navy training feedback process.

Bildhauer (1971) noted that much the same situation still existed in evaluation of Navy training programs as was documented in the earlier Peters and Chambers (1964) report. He concluded, "the environment of most training programs actually prevents the accomplishment of feedback." To aid in correcting this situation, Bildhauer developed plans, procedures and an organizational structure for an integrated Navy-wide Training Feedback Subsystem (TFS).

Although the Bildhauer (1971) report was prepared for the Chief of Naval Personnel, it became an important working paper in the Training Appraisal Branch (N-34) of the new CNET. Development of the TFS continued in this branch including a study by Lane (1972) of the use of questionnaire methods for obtaining field evaluation data. The conclusion of that report was that questionnaires were suitable for this purpose, if proper procedures for their construction and administration were used. Another result of TFS development at CNET was a second report by Bildhauer (1973) which documented the evolution of the TFS from his earlier conception and described the development and organizational structure of one local evaluation unit (Service School Command, Orlando). From the standpoint of the present study, the most critical outcome of CNET work on the TFS was the assignment to TAEG of the task of developing a vehicle to provide feedback information from the operational units to the schools.

CHARACTERISTICS OF AN EFFECTIVE FEEDBACK METHOD

An optimally effective post formal training feedback method would provide accurate information to the schools related to the success or failure of school training for every job task that the trainee may be asked to perform. The training failures which such a feedback method would help to identify fall into the categories of undertraining (including missing training), overtraining, and irrelevant training.

Undertraining is a failure of the school to provide sufficient skills to the trainee to enable him to adequately perform a job task. It is the most critical training failure since it reduces the operational readiness of the unit to which the trainee is assigned. Overtraining occurs when more training is given than is needed to perform a job task and training resources are thereby wasted. An even larger waste of resources occurs in irrelevant training, where skills and knowledge are acquired that have no bearing on present or future job performance.

Any post formal training feedback method that provides accurate data on the existence of each of these training failures, as well as identifying training successes, will necessarily be reliable and valid. However, a number of additional desirable characteristics exist for an effective feedback method. Probably the most important of these is low cost for development and administration. Some methods, such as personal interviews with Fleet personnel, become extremely expensive if enough visits are made to provide reliable data, and mail-out questionnaires have been found to be much less expensive (Scott, 1961). It is also desirable that a training feedback method operates quickly. Training problems should be corrected as soon as possible following their appearance and, therefore, the time lag to obtain indications of these problems must also be short. In addition to low cost and speed, it is important that the method be simple and easy to administer since any procedure that depends on complicated analysis techniques will probably not be carried out. Finally, the training feedback method should require a minimum number of personnel for its execution. Military training units are often understaffed and a feedback procedure that requires a great amount of time by training personnel for its administration will probably be neglected.

POST FORMAL TRAINING FEEDBACK TECHNIQUES

The ultimate source of feedback information is the performance of the trainee on the job, and many ways exist to obtain such data. Probably no training program is completely lacking in procedures for obtaining such information. However, not all methods have the capability of identifying all the classes of training problems discussed above. For example, analysis of records of equipment failure can provide information about undertraining, but little or no information about overtraining and irrelevant training. To a lesser extent, proficiency testing shares this weakness. Techniques, such as questionnaires, which do have the potential to provide data on all three classes of training failures, often fail in the attempt, because low return rates or poor questionnaire design reduce the reliability of the data. Even when usable data are obtained in sufficient quantities, it often is not properly analyzed to identify significant trends.

The existing techniques were the starting point in our search for an effective Navy post formal training feedback method. They are presented below to provide an overview of possible procedures and their relative adequacy. If time and personnel are available, some of these methods can be used as sources of feedback data along with the particular long questionnaire method recommended in this report.

PROFICIENCY TESTING. Objective criteria which indicate the success of the trainee's performance can be measured. These include such things as meter readings, signal-to-noise ratios, and amplification factors. Along with these products of performance, the time to complete tasks and the manner of their completion can be observed. These various objective measurements can then be compared to standards that have been established as representing proper performance. Since many aspects of military jobs are not routinely performed, simulated environments can sometimes be utilized to allow objective indications of performance for these job behaviors. Although the resultant data provide excellent feedback information in most situations, the disadvantages are likely to outweigh the benefits obtained. This method is costly, time consuming and requires highly skilled personnel to develop and administer the measuring instruments. In addition, the equipment may not be available for testing since its use for this purpose could preclude its use in day-to-day operations. For more detailed information on the reasons for avoiding performance testing as a feedback technique see Harris and Mackie (1962).

JOB-RELEVANT KNOWLEDGE TESTING. In addition to measurement of performance in real or simulated environments, hypothetical job situations can be established by the use of written questions to determine if the knowledge required for successful performance is present in the job incumbent. This is basically the approach of the Personnel Testing and Evaluation Program (PTEP) being used by the Fleet Guided Missile School. This procedure is closely related to proficiency testing and promises to have value for the training community. The PTEP is presently being used by the subsurface community for identification of specific personnel performance weaknesses, but its potential as a training feedback technique should be explored.

ANALYSIS OF EXISTING RECORDS. Data on equipment failures from records such as 3M, Maintenance Data Forms, Records of Mobile Technical Units, Fleet Training Group Reports, are primarily hardware oriented, but to the extent that they are indices of student performance (failures), they are a source of training feedback information. Records such as Safety Reports and Reports of Refresher Training can also give insight into training problems to the extent that they reflect poor performance of the trainee on the job. One problem with this method of obtaining information is that these records are not widely distributed. Additionally, the data must be verified by cross-checking other sources.

VISITS: INFORMAL/UNSTRUCTURED. Training personnel may visit the job site for general discussion of trainee performance rather than to obtain data on a specific training issue. This approach suffers because of the small amount of information obtained. It may only have the advantage of demonstrating to Fleet units that training personnel care enough about supporting them to come aboard. These visits can be made more profitable by adding structure to the visit through the use of proper questioning techniques (see structured interview below). Considering the value of the data usually collected, the cost of this method makes it a questionable technique for continuing use.

INFORMAL FEEDBACK. At times people in the operational environment wish to express their concern for, or satisfaction with, training. Such unsolicited information may be transmitted by letter, phone call, or personal contact. Much of this information is broad and may lack important details. This data should be considered as a starting point for further investigation, rather than taken directly at face value.

ROTATION OF FLEET/TRAINING PERSONNEL. Much information about the adequacy of training may be obtained from newly reporting school personnel. They are usually capable, well-motivated people with knowledge about how effectively school graduates perform their jobs. Information should be obtained during skilled debriefing sessions shortly after their arrival. All opinions should be backed by observation and preferably with specific examples. It is essential that the information obtained in this way be evaluated in the light of the respondent's experience and qualifications. Cross-checking with the operational unit on specific training failures would be important for validating the information received. The use of a questionnaire which provides for ratings of performance on all job tasks should be used for debriefing these personnel.

PERFORMANCE DIARY. The Performance Diary is a running report, by the school graduate, of the tasks he performs and the problems he encounters on the job. It demands a high degree of cooperation between the school and the job incumbent and requires much time and effort on the part of the trainee. When suitable personnel have been found to keep such diaries, the information contained therein has been useful for training purposes. However, the data obtained must be carefully evaluated. The fact that a capable technician feels a particular portion of the training was helpful to him, does not mean that it would help the average student. On the other hand, if the diarist reports that he has difficulty, or cannot perform an operation which was taught in school, an examination of that phase of instruction may be in order.

VISITS: STRUCTURED INTERVIEW. The details of the job are structured in terms of statements derived from a job task analysis. Interview forms (checklists, rating scales, questionnaires, etc.) are constructed which can be completed within one to three hours of interview time. Training personnel visit the operational unit and administer the forms on a face-to-face basis. This technique has been used satisfactorily by Bilinski and Saylor (1972) and Standlee, et al., (1972) who examined the job performance of Navy Storekeeper graduates and electronic maintenance personnel, respectively. Because of its structure, this approach yields more information (and more reliable information) than the unstructured interview. It is superior to mail-out procedures in that there is no problem about return rate or waiting for replies. Also, much additional information can be gained about frequency of operations and maintenance as well as about tasks performed other than those pertaining to the technical rating. While this technique is usually too costly in time and money to be used as a continuing feedback method, it is valuable for use in locations where operational units are close to the school.

MAIL-OUT QUESTIONNAIRE. Questionnaires have been used frequently to obtain training feedback data. They offer the advantage of being less costly than the personal interview method. In addition, the questionnaire is relatively free of interviewer bias. The format for construction of questionnaires has varied to include open-ended questions, closed-ended questions, and/or rating scales. Items have been based on task statements obtained through job task analysis (as in this study); on job dimensions determined by factor analysis, as in Siegel and Federman's (1970) study of the electronics ratings; or, as is most often the case, on the existing school curriculum. Procedures for administration have also taken many different forms. The questionnaire has been carried by the graduate to his duty station or mailed at some specified time after graduation. They have been administered to the trainee, to the supervisor, or to both. Also, different amounts of time have been permitted to lapse following graduation prior to mailing of the questionnaire. Navy use of this technique has suffered from a low return rate. An average return rate of only 10 percent was reported in a recent survey of Navy feedback methods (TAEG Report No. 12-1, 1973). Another disadvantage often mentioned has been the lack of reliability of this data. It has been argued, however, that satisfactory return rates and useful reliable data can be obtained when appropriate procedures are followed in their construction and administration (Lane, 1972).

FACTORS THAT IMPACT ON TRAINING FEEDBACK

Many factors contribute to the widely varying effectiveness observed in training feedback efforts. For example, the very poor results noted in the recent survey of Navy feedback efforts (TAEG Report No. 12-1, 1973) were attributed largely to the predominant use of mail-out instruments instead of personal interviews. Other factors that are, or may be, related to the success or failure of feedback efforts, particularly those employing questionnaires, include the length and format of questionnaires, the person or persons providing the information, the time lapse following graduation prior to gathering the data, the ability and conscientiousness of the person providing feedback data, and the effect of discussion or notification of the feedback effort prior to actual administration. Each of these factors is discussed below. Particular attention is given to the need to include each factor in an empirical test of feedback methods to clarify the role of the factor in training feedback effectiveness.

PERSONAL VS. MAIL-OUT CONTACT. Many studies indicate that well-constructed and carefully administered mail-out instruments can provide accurate and reliable data. These include studies (Bougler, 1970; Scott, 1961) in which no differences were found between data obtained from mail-out interviews and personal interviews. However, mail-out procedures were severely criticized in the recent survey of training feedback practices in the Navy (TAEG Report No. 12-1, 1973) because of the low return rate and because the data were often judged to be unreliable. Prior to the selection and development of a feedback method for Navy-wide use, it was very important to resolve these contradictory positions about the effectiveness of mail-out procedures. Since a comparison of mail-out interviews and personal interviews had not been done in the area of military training, an experiment was needed to compare these procedures in a Navy training setting. If mail-out procedures were found adequate for the job, the savings for the training community would be huge.

LENGTH AND FORMAT OF FEEDBACK INSTRUMENTS. Long questionnaires provide the opportunity for a more comprehensive evaluation of training than short questionnaires. However, long questionnaires are more apt to produce fatigue and boredom in the respondent. Thus, the benefits of length may be cancelled because of reduced accuracy of the data or because very few questionnaires are returned. For these reasons, short questionnaires might provide better data than long questionnaires despite their limitations. To obtain better knowledge of the relationship between questionnaire length and effectiveness, it was essential to include both long and short questionnaires in the present experiment comparing mail-out interviews with personal interviews. Data from the long questionnaires would also provide the opportunity to assess the accuracy of questionnaire data from different item locations. Presumably, items appearing early would provide better data and the number of items into the questionnaire at which data become less accurate would provide an indication of the maximum length for questionnaires.

Responding to mail-out questionnaires is closely related to the kind of behavior required for paper and pencil examinations. Some of the poor results observed in Navy use of feedback questionnaires could be related to an aversion for such examination-like tasks. Bilinski and Saylor (1972) used a novel format for feedback instruments in an assessment of training for the Navy Storekeeper rating. They conducted structured interviews in which cards, with printed task statements, were sorted into one of several different categories related to levels of performance of a trainee on the task. This successful format and procedure for interviews appeared to be adaptable for mail-out instruments. Because of its simplicity and novelty, it might provide a higher return rate and more reliable and more valid data than more traditional formats. The possible advantages of this technique argued for its inclusion in the study comparing feedback methods.

TRAINEE VS. SUPERVISOR ADMINISTRATION PROCEDURE. Probably the most important question related to administration of any feedback method is that of who should provide the ratings of trainee performance. The trainee has a direct and recent knowledge of school training and also has a direct, though limited, acquaintance with the requirements of his new job. On the other hand, the supervisor has a much more complete and accurate conception of adequate job performance but little knowledge of current training at the school. Thus both the trainee and supervisor have special perspectives that, in theory, make input from both essential for a complete training feedback data base. However, even if their data were identical, it would be useful to share the workload between trainees and supervisors. If both trainees and supervisors are to be contacted, the additional question arises as to whether both members of a trainee-supervisor pair should be interrogated or only one member from each pair. An experiment investigating different methods could also be used to compare the accuracy and reliability of data from these different groups of respondents.

TIME LAPSE PRIOR TO ADMINISTRATION. Another factor impacting on training feedback is the lapse of time following graduation prior to mailing a questionnaire or conducting an interview. More time on the job will allow a better conception of job requirements to develop in the trainee, but it will also lead to more forgetting of school training problems, particularly those problems that are corrected by on-the-job training. A similar benefit and disadvantage would accrue to supervisors as elapsed time between graduation and evaluation increases. They would have more time to observe the trainee on the job but more possibility would exist for confounding of on-the-job and school training. In a study of feedback methods, the data from respondent groups made up of persons with different times from graduation could be compared to help provide an answer to the complex question regarding the optimal time from graduation to wait prior to obtaining training feedback.

EXPECTATION OR "SET" TO RESPOND. Representations of the future such as goals and expectations play an extremely important role in human behavior. A person who receives notification that he will be receiving a feedback questionnaire will probably be more receptive to it when it arrives than the person who is surprised by its appearance. However, such expectations might work to reduce the accuracy and care of responding, at least for some respondent groups. A test of the effects of prior notification by "expectation letters" was needed.

CLASS STANDING OF THE GRADUATE. Training is probably experienced very differently by persons who graduate at the top, middle and bottom of their classes. In addition, the more conscientious and able student may be a more conscientious and accurate provider of feedback data. Good reasons thus exist for analyzing feedback data separately for these groups and an examination of these possible differences was included in the study of feedback methods.

SECTION II

TECHNICAL APPROACH

A number of issues critical to the selection and development of a Navy training feedback method required empirical data for resolution. For this reason, an investigation was conducted in which different feedback methods were applied in an actual Navy school/job setting. Specific training problems were already known to exist at the chosen test location (the Radioman "A" School) and this allowed comparison of the different instruments and procedures to determine the effectiveness of each for such problem identification. Of more importance, it provided the answer to the question of whether or not any of the methods could provide this information from the operational units to schools about training problems.

VARIABLES INVESTIGATED IN THE STUDY

Each of the factors impacting on feedback effectiveness described in the previous section became a variable that was investigated in the study. In addition, a variable based on where the graduate was stationed was included, since this was closely related to the problems known to exist in the training curriculum for Radioman "A" School.

The following variables were investigated and are discussed below. Variables related to the instruments included:

- Type of instrument
- Normal vs. reversed item order

Variables related to characteristics of personnel receiving instruments included:

- Supervisor or trainee respondent
- Joint vs. single administration
- Class standing of graduate
- Time from graduation
- Expectation vs. non-expectation
- Ship vs. shore duty station

The major variable under investigation was the type of feedback instrument. Three instruments used mail-out procedures to obtain data and one used a structured personal interview. One mail-out instrument was a long questionnaire that required ratings of task frequency, task criticality, and trainee performance on 134 specific job tasks performed by Radiomen. Another was a short questionnaire that required the same ratings on 15 general job tasks which subsumed the specific job tasks of the long questionnaire. The final mail-out instrument was a card-sort procedure where 134 cards, with the specific job tasks, were sorted into different stacks related to the frequency of task performance and the level of trainee performance on the task. The structured interview used the long questionnaire, but it was administered in a face-to-face situation with the interviewer writing down the ratings as they were told to him by the person being interviewed.

A second variable in the study also involved the type of instrument used. This was a two-level variable defined by whether the items on the instrument were in normal or reversed order. This variable was included to obtain information about possible differences in ratings of an item depending upon the position of the item in the questionnaire. It was completely "crossed" with the three-level factor of mail-out instrument type. This means that one-half of the questionnaires of each type had reversed item order and one-half had normal item order. It also means that one-third of the reversed-item-order instruments were long questionnaires, one-third were short questionnaires, and one-third were card sort instruments. Finally, this complete "crossing" of these two factors implies that the same proportions (one-third of each questionnaire type) held for the instruments with normal-item-order.

The other six variables included in the investigation are all related to characteristics of the personnel who were mailed the feedback instruments. The most important of these variables involved whether the respondent was a supervisor or trainee. Another two-level variable (referred to as joint vs. single administration) was determined by whether the instrument was mailed to only one member of the supervisor-trainee pair or to both members of the pair. A three-level variable was defined by the class standing of the graduate. Class graduation rosters were divided into thirds on the basis of class standing to allow separate investigation of feedback accuracy for groups at the top, middle and bottom of their classes. A four-level variable was determined by the time lapse from graduation prior to administration of the instrument. The groups were 4 to 6 months time lapse, 7 to 9 months, 10 to 12 months, and greater than 12 months. A two-level variable was determined by whether or not the person had received an "expectation letter" prior to the questionnaire, informing him of its imminent arrival. The final two-level variable was related to whether the graduate was assigned to a ship or to a shore duty station.

Some of these variables, such as duty station of the graduate and time from graduation, were not under the control of the investigators. Others, such as questionnaire type and the presence or absence of "expectation letters," were assigned randomly to trainees and supervisors. Wherever possible, equal numbers of each level of a variable were included in every level of every other variable. For example, equal numbers of the three different mail-out instruments were assigned to personnel stationed at shore duty stations and to personnel aboard ships. This procedure allows a single experiment to provide accurate data on each of the factors which is included and "crossed" with other factors. Eight single-factor experiments would be required to provide the data available from the present study with its eight different factors. In addition, this multi-factor approach allows a finer analysis of the data in terms of sub-groups of persons. Since a wide range of variables are included, this approach also provides results having greater generalizability than single-factor experiments.

To establish possible differences among the above factors, the following dependent variables were studied: time until return of the instrument, percentage of instruments returned, average ratings for job task items, and finally, a measure of questionnaire completion accuracy based on deviations of ratings of task frequency from known frequencies for certain job tasks.

SELECTION OF A SCHOOL/JOB SETTING FOR THE STUDY

It was essential to identify a training program which actually exhibited a substantial number of each of the three classes of training problems (undertraining, overtraining, and irrelevant training), in order to establish the effectiveness of any feedback method, and to make valid comparisons between different methods and different groups of respondents. An additional requirement for the program was that a large number of school graduates be available to obtain reliable comparisons among a number of instruments, groups and conditions.

The Radioman "A" School most nearly met the criteria stated in the paragraph above and was selected as the test bed for the development of "prototype" feedback instruments and procedures. This school was deemed most suitable since at the time of initial contact, a major curriculum revision had just been completed based on a task analysis made two years previously. The new curriculum included a number of important new job tasks that were not included in the old, and thereby corrected many instances of undertraining which existed in the old curriculum. However, the major difference between the old and new curricula was that separate tracks were instituted for shipboard Radiomen and for shore-based Radiomen. The separate tracking eliminated a great deal of overtraining and irrelevant training on shipboard communications that existed for shore-based personnel. This also eliminated the waste of training resources that existed for shipboard personnel who were being taught a great deal about shore communications that they might never use or could obtain later in their careers as the need arose.

Although the new Radioman "A" School curriculum had been developed, it had not yet been implemented and the existing curriculum was still producing approximately 50 graduates per week from the Bainbridge and San Diego schools. This large number of graduates, plus the documented examples of training problems, made this an ideal setting for an empirical comparison of feedback methods. In addition, school personnel and the Training Program Coordinator for the school expressed a willingness to cooperate and aid in this effort.

IDENTIFICATION AND LOCATION OF SCHOOL GRADUATES AND SUPERVISORS

Prior to administering feedback instruments, it was essential to have accurate data on the location of Radioman "A" School graduates and to have the names of their supervisors. One reason for this was that only one mail-out instrument would be mailed to a supervisor regardless of the number of graduates he supervised. It was feared that mailing more than one instrument to a supervisor would be burdensome and cause supervisor resistance to the study which in turn would reduce the return rate of the instruments. Also, accurate pinpointing of graduate locations would insure that return rate statistics would be less influenced by delayed or lost questionnaires. Finally, one of the key variables of the study was the ship or shore location of the graduate, and accurate identification of his whereabouts was essential for correct data analysis on this ship/shore duty station factor.

To obtain these data, letters were prepared and mailed to the different operational units receiving Radioman "A" School graduates. Communication Officers were asked to confirm whether the trainee was stationed at the unit and to add to the list the names of any additional recent graduates. Finally, they were asked to add the name of the supervisor who was most familiar with the graduate's performance from the date of his arrival.

Permission to contact operational units was obtained from the Atlantic and Pacific Fleets and from the Naval Telecommunications Command. At the same time, permission was obtained to mail the feedback instruments directly to the trainee and to the supervisor. Such direct contact reduced handling of materials by command personnel. With the large number of persons to be contacted in the study, such handling could have become burdensome and a potential source of non-cooperation.

INSTRUMENTS

Three versions of the mail-out questionnaire were compared in this study. These were (1) a short questionnaire with items based on general job tasks including several open-ended questions to get at specific training problems, (2) a long questionnaire based on specific job tasks, including one open-ended question, and (3) a card sort procedure using the same task list and open-ended question as were used for the long questionnaire. Two different versions were prepared for each of these instruments, one for the trainees and one for the supervisors. In addition, versions of each were prepared with normal and reversed item order as a means of exploring changes in the accuracy of responding as a function of the length of the instrument. Fatigue or boredom effects would show up as differences in average ratings for the same item when it was encountered early in one version and later in another.

All three mail-out instruments were designed to provide information about undertraining, overtraining, training relevancy, and missing training. The long questionnaire and card sort instrument provided information on the first three training problems by obtaining ratings of specific job tasks that were listed in the instrument. Missing training objectives were to be identified by the open-ended question. Specific tasks were not listed on the short questionnaire, only general ones. Seven open-ended questions were added to get at undertraining, overtraining, and training relevancy for specific job tasks as well as to get at missing training objectives.

SHORT QUESTIONNAIRE. The 15 general task statements used in the short questionnaire are presented in appendix A. At a very general level these describe the work performed by Radiomen at Fleet and shore units. These items were typed on two pages of the form presented in appendix C. This basic form (with minor changes) was used on both the long and short questionnaires and provided the three scales of Frequency of Task, Criticality of Task, and Performance of Task Upon Arrival From School; space for eight task descriptions; and a brief set of instructions. The respondent indicated his rating on these scales by circling a number corresponding to one of the five available alternatives for each. Seven open-ended questions (appendix D) were added at the end of the short questionnaire. The initial page of the questionnaire was a cover letter (appendix E). It was followed by instructions (appendix F), a biographical data sheet (appendix G), then the general task pages and, finally, the open-ended questions. Appendixes D through G are from the trainee version of the short questionnaire. The supervisor version of these forms differed only in minor changes of wording. Time to complete the short questionnaire was about 15 minutes.

LONG QUESTIONNAIRE. The long questionnaire utilized the 134 specific job tasks presented in appendix B. Most of these were taken from both the old and new curricula. Those related to radiotelegraph operation came from the job task analysis, but are not included in either the old or new curricula. The questions were printed on 20 pages of the same basic rating scale form (appendix C) used in the short questionnaire, and made up the bulk of the document. The same cover letter, instructions, and biographical data sheet as those used on the short questionnaire preceded these tasks and rating scales. The final page of the long questionnaire was a single open-ended question (appendix H) designed to identify new areas of instruction which should be added to the curriculum of Radioman "A" School. Supervisor versions of the long questionnaire presented only minor modifications of the forms in the appendixes. The time to complete the long questionnaire averaged approximately one hour.

CARD SORT PROCEDURE. The card sort procedure used the same 134 items as the long questionnaire. These were printed on small cards (2.25 in. x 4 in.) with one task statement per card. A "placemat" contained six rectangles labeled with the categories into which the 134 cards were to be sorted and also included the instructions for this sorting. The "placemat" is presented in appendix I. Labeled rubber bands were enclosed to be used following sorting of the cards to make six separate packets that were to be returned along with the same biographical data sheet (appendix G) and open-ended question (appendix H) that were used with the long questionnaire. A Supervisor "placemat" with minor changes was also used. Time to complete this card sort procedure averaged about 30 minutes.

STRUCTURED INTERVIEW. In addition to the mail-out feedback procedures, face-to-face structured interviews were conducted. A long questionnaire was used for this purpose with separate copies for the interviewer and interviewee. The person being interviewed was asked to read the task statement aloud then tell his ratings on the three scales to the interviewer who marked these on his copy of the long questionnaire. After all tasks had been considered, those which received "inadequate" Performance of Task Upon Arrival From School ratings were reviewed and specific questions about training for these tasks asked. Answers were recorded by the interviewer. Suggestions for additional material to be included in the curriculum were also requested and recorded. This procedure guaranteed that consideration would be given to each item and produced a large amount of discussion relevant to training for the different tasks. Average time for these interviews was one hour and twenty minutes.

SUBJECTS

Instruments were mailed to 996 trainees and 590 supervisors and structured interviews were administered to an additional 59 trainees and

37 supervisors. The names of these personnel were obtained from verified lists of graduates returned from operational units. The trainees were graduates of the unmodified Radioman "A" School curriculum during the period May 1973 to July 1974. Almost without exception, these graduates were early in their first enlistment with most going directly from recruit training to "A" School. Supervisors were usually First Class or Chief Petty Officers with 10 or more years of service. The different numbers of trainees and supervisors resulted from the fact that a supervisor often supervised more than one trainee.

More of these personnel were stationed at shore installations (885) than aboard ships (701) and the difference reflects the fact that a majority of Radioman "A" School graduates receive their first assignment at shore stations. Two or more trainees are more apt to have the same supervisor if the trainee is at a shore installation than if he is aboard ship. This difference can be seen in table 1 which presents a breakdown of subjects in the study by factors of supervisor vs. trainee, feedback method, and duty station.

TABLE 1. NUMBER OF TRAINEES AND SUPERVISORS AT DIFFERENT DUTY STATIONS RECEIVING DIFFERENT INSTRUMENTS

	Long Questionnaire	Short Questionnaire	Card Sort	Structured Interview
Trainees:				
Ship	136	144	135	18
Shore	192	196	193	41
Supervisors:				
Ship	96	101	89	19
Shore	100	105	99	18

The fact that many trainees shared a supervisor and only one instrument was mailed to a supervisor resulted in another imbalance in the numbers of subjects in the joint vs. single administration conditions. Three hundred and fourteen supervisors were selected randomly and assigned to the joint administration condition. This made a total of 622 trainees and supervisors receiving joint administration. The remaining 279 supervisors of recent graduates received instruments but recent graduates they supervised did not. The remaining 685 available trainees also received instruments but their supervisors did not (unless the supervisor received a form to complete on another trainee). This made a total of 622 persons in the joint-administration condition compared to the 964 with single administration.

Approximately equal numbers of subjects were assigned to different levels of the factors of Instrument Type, Class Standing, and Item Order. Differences did exist in the number of subjects in the different Time Lapse from Graduation groups. These differences reflected normal variations in graduate output during the year and also the inclusion of graduates from a five-month period in the greater-than-12-months time-lapse group. The only other imbalance that appeared in numbers for different levels of a factor was in the Expectation Letter vs. No Expectation Letter groups. This resulted because not all data requests from operational units had returned before questionnaire mailing began. Late arriving names of trainees and their supervisors were mailed questionnaires, but to prevent further delays in their mailing, none of these personnel received the prior expectation letter. For this reason, the number of questionnaires preceded by "expectation letters" (758) was smaller than the number mailed without these letters (828).

The imbalances in numbers of subjects that existed in many conditions were not large enough to reduce the reliability of data from smaller groups. However, data from these groups required careful analysis and interpretation to avoid confounding of effects associated with one variable with the effects associated with another.

PROCEDURE

Four to six weeks prior to mailing of the instruments, approximately one-half of the trainees and supervisors were mailed a letter announcing the arrival of the feedback materials and requesting consideration of training problems in Radioman "A" School. In the joint administration condition, where both trainee and supervisor were to be mailed instruments, both persons received the "expectation letter" or neither did. The bulk of the feedback instruments was mailed November 17 through November 19, 1974 with the remainder being mailed over the next month as additional verified data on trainee location and supervisors were returned from operational units. Each instrument was accompanied by a self-addressed return envelope.

Follow-up procedures were initiated at seven and at nine weeks after mailing of the evaluation materials. The first follow-up to nonrespondents was a simple reminder letter requesting the return of the questionnaire. The second requested that they indicate their reasons for not returning the materials and asked for suggestions for improvement in future evaluation efforts. A follow-up letter was also mailed to those persons who had completed and returned the questionnaire asking them to relate any problems they may have had completing the materials and to suggest improvements for future feedback efforts.

As instruments were returned, the rating scale data were immediately punched on cards for analysis. A seven-digit identification code was included on these cards that designated the status of the respondent on the variables of Trainee vs. Supervisor, Joint vs. Single Administration, Questionnaire type, and the remaining five variables studied. When it appeared that no more instruments were forthcoming, statistics were calculated including return rates for the various conditions and subconditions, averages and standard deviations of rating scale data, and similar statistics on time to return and numbers of comments.

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SECTION III

RESULTS

Results are presented for the major dependent variables of instrument return rate, responses on the rating scales, responses to open-ended questions, and the results of follow-up efforts that took place after the main comparison of feedback methods. Descriptive statistics are tabulated and the statistically significant differences are described in the text. The decision rule selected for statistical significance was that a result should occur by chance only five times or less out of 100 ($p < .05$).

INSTRUMENT RETURN STATISTICS

The instrument return statistics include the overall return rate for instruments, the time from mailing until questionnaire return, and the percentage of persons receiving reminder letters who responded following the reminder letter. These instrument return statistics are described below for each of the factors included in the study. The order of presentation of factors is generally related to the magnitude and importance of the observed differences.

RESPONDENTS. Statistics on instrument return for trainees and supervisors are presented in the top part of table 2. The return rate for supervisors was almost double that of trainees and the difference was highly significant ($z = 5.2$, $p < .001$). The percentage of reminder letters producing returned instruments was also much higher for supervisors than trainees and highly significant ($z = 6.5$, $p < .001$). The difference in average time from mailing to return was not significant for these two groups.

INSTRUMENTS. The data for instruments are presented in the middle of table 2. There was a significantly higher return rate for the short questionnaire than for either the long questionnaire or card sort procedure ($z = 3.7$ for short vs. long; $z = 3.4$ for short vs. card sort; $p < .001$ for both). The small difference between the long questionnaire and the card sort instrument was not significant. Differences among the three instruments for the percentage of reminder letters producing returned questionnaires also were not significant. However, the longer average time to return for the long form than the short form was significant ($t = 3.2$, $df = 460$, $p < .01$), as was the difference in time to return between the long form and the card sort instrument ($t = 2.0$, $df = 392$, $p < .05$).

Instrument return data on the combined factors of Instrument Type and Respondent are presented in the bottom part of table 2. For trainees, the return rate for the short form was significantly higher than for the

TABLE 2. NUMBER OF INSTRUMENTS MAILED AND RETURNED AND AVERAGE TIME TO RETURN FOR DIFFERENT RESPONDENT GROUPS AND INSTRUMENTS

	Instrument or Group	Number of Instruments Mailed	Number of Instruments Returned	Percent of Instruments Returned	Number Returned After Reminder Letters	Percent of Reminder Letters Producing Return	Average Days From Mailing to Return
Respondent	Trainee	996	310	31.1	43	5.9	32.1
	Supervisor	590	350	59.3	66	21.6	35.1
Instrument	Short Form	546	266	48.7	38	11.9	30.7
	Long Form	524	196	37.4	43	11.6	38.8
	Card Sort	516	198	38.4	28	8.1	33.2
Respondent X Instrument	Short-Trainee	340	136	40.0	19	8.5	31.0
	Long-Trainee	328	83	25.2	14	5.4	36.2
	Card Sort-Trainee	328	91	27.7	10	4.0	32.2
	Short-Supervisor	206	130	63.1	19	20.0	30.4
	Long-Supervisor	196	113	57.7	29	25.9	41.3
	Card Sort-Supervisor	188	107	56.9	18	18.2	34.0

long form or the card sort ($z = 4.0$ for short vs. long; $z = 3.3$ for short vs. card sort; $p < .001$ for both). In addition, for trainees the percentage of short questionnaires returned as a result of reminder letters was significantly higher than the corresponding percentage for the card sort instrument ($z = 2.0$, $p < .05$). For supervisors, the corresponding differences between instruments were considerably smaller and not statistically significant.

TIME LAPSE PRIOR TO EVALUATION. Data for groups with different times from graduation prior to evaluation are presented in the top half of table 3. The 4 to 6 months group yielded a lower return rate than each of the two longest periods ($z = 2.6$ for the 4 to 6 vs. 10 to 12 groups; $z = 2.5$ for the 4-6 vs. greater than 12 groups; $p < .05$). The other return rate differences among these groups were not significant. None of the differences in time to return and percentage of instruments returned following the reminder letters were significant for these groups.

ADMINISTRATION PROCEDURE. Instrument return statistics are presented at the bottom of table 3 for the factor of Joint vs. Single Administration of the instruments. Unequal numbers of trainees and supervisors in the single administration condition required the breakdown of these results by the Respondent Group factor. Although a higher return rate in favor of joint administration appeared for both trainees and supervisors, it was not significant ($z = 1.6$, $p < .11$). No significant differences occurred between joint and single administration on the other return statistics.

CLASS STANDING. Instrument return statistics are presented in table 4 for the different Class Standing groups with separate data presented for trainees and supervisors. The significant differences for trainees were on the percent of instruments returned and on the percent of successful reminder letters. Trainees in the bottom third of their graduating classes returned significantly fewer instruments than trainees in the upper and middle third of their classes ($z = 3.3$ for lower 1/3 vs. upper 1/3; $z = 2.7$ for lower 1/3 vs. middle 1/3; $p < .01$ for both). Trainees in the lower third of their classes also accounted for a lower percentage of reminder letters producing return than was found for trainees in the upper third of their classes ($z = 2.3$, $p < .05$). Supervisors took significantly longer to return instruments for the lower third of graduates than the other groups ($t = 2.74$, $df = 238$ $p < .01$ for lower 1/3 vs. upper 1/3; $t = 2.23$, $df = 221$, $p < .05$ for lower 1/3 vs. middle 1/3).

TABLE 3. NUMBER OF INSTRUMENTS MAILED AND RETURNED AND AVERAGE TIME TO RETURN FOR DIFFERENT TIME FROM GRADUATION GROUPS AND ADMINISTRATION PROCEDURES

Experimental Condition or Group		Number of Instruments Mailed	Number of Instruments Returned	Percent of Instruments Returned	Number Returned After Reminder Letters	Percent of Reminder Letters Producing Return	Average Days From Mailing to Return
Time Lapse Prior To Evaluation (Months)	4-6	340	120	35.3	19	7.9	34.1
	7-9	408	168	41.2	32	11.8	35.8
	10-12	279	127	45.5	19	11.1	33.4
	More than 12	559	245	43.8	39	11.0	34.7
Administrative Procedure	Joint - Trainee	311	106	34.1	16	7.2	31.4
	Single - Trainee	685	204	29.8	27	5.3	32.6
	Joint-Supervisor	311	192	61.7	38	24.2	35.5
	Single-Supervisor	279	158	56.6	28	18.8	33.7

TABLE 4. NUMBER OF INSTRUMENTS MAILED AND RETURNED AND AVERAGE TIME TO RETURN FOR DIFFERENT CLASS STANDING GROUPS

Group		Number of Instruments Mailed	Number of Instruments Returned	Percent of Instruments Returned	Number Returned After Reminder Letters	Percent Returned After Reminder Letters	Average Days From Mailing to Return
Trainee Class Standing	Upper 1/3	320	115	35.9	18	8.1	35.8
	Middle 1/3	333	112	33.6	16	6.8	31.9
	Lower 1/3	343	83	24.2	9	3.3	28.1
Supervisor Class Standing	Upper 1/3	212	127	59.9	22	20.6	28.2
	Middle 1/3	176	110	62.5	14	17.5	30.5
	Lower 1/3	202	113	55.9	31	25.8	40.5

OTHER FACTORS. Instrument return statistics for the factors of Duty Station, Item Order, and Expectation Group are presented in table 5. None of the differences between ship and shore duty station were significant for any of the dependent variables. This was also true for instruments with normal item order as opposed to reversed item order. Significantly more instruments were returned, however, for the group receiving "expectation letters" before the questionnaires than for the group that did not receive these letters ($z = 2.0$, $p < .05$). When data from trainees and supervisors were considered separately for the "expectation letter" factor, only the return rate difference for trainees was significant ($z = 1.8$, $p < .05$).

RATING SCALE DATA

Since the rating scale data are the prime means for identification of training successes and failures for different tasks, they are also the key data for judging instrument effectiveness in the comparison of instruments and respondent groups. For all rating scales the scale values ranged from one to five. High frequency of tasks, high criticality of tasks, and good performance of tasks were indicated by high numbers on the respective scales.

DIFFERENCES AMONG ITEMS. The largest source of variance in all comparisons was among the items themselves. This was particularly true on the Frequency of Task scale where overall means ranged from 1.25 (item No. 124 of appendix B) to 4.6 (item No. 6 of appendix A). Since only a difference of four units existed on any of the five-point scales, this range of 3.35 units for ratings, averaged over all subjects, indicated an extremely accurate and consistent pattern of responding by nearly all the personnel who returned questionnaires. Even more extreme average ratings occurred when ship and shore results were considered separately. Nearly one-third of the items showed average Frequency ratings above 4.5 or below 1.5.

The accuracy and consistency of ratings were also dramatically illustrated in the high correlations found when average item ratings were correlated between different instruments, between respondent groups, and even between the ratings on the different scales (e.g., Frequency with Criticality). Correlations between average item ratings for the three rating scales are presented in table 6. It can be seen that these correlations between scales on the short form were all nearly 1.00. Although these correlations were also high on the long form of the questionnaire, each was significantly lower than the corresponding correlation for the short form ($p < .05$). The lower correlations for the long questionnaire indicate a more accurate description by this instrument of the known differences that exist among the variables of task frequency, task criticality, and trainee task performance.

TABLE 5. NUMBER OF INSTRUMENTS MAILED AND RETURNED AND AVERAGE TIME TO RETURN FOR DIFFERENT DUTY STATIONS, ITEM ORDER, AND EXPECTATION GROUPS

Experimental Condition		Number of Instruments Mailed	Number of Instruments Returned	Percent of Instruments Returned	Number Returned After Reminder Letters	Percent Returned After Reminder Letters	Average Days From Mailing to Return
Duty Station	Shore	885	373	42.1	53	9.4	32.3
	Ship	701	287	40.9	56	11.9	36.2
Item Order	Normal Order	803	348	43.3	62	12.0	36.2
	Reversed Order	783	312	39.8	47	9.1	32.0
Expectation Letters	Letter, Trainee & Supervisor	756	335	44.2	57	11.9	33.7
	No Letter, Trainee & Supervisor	828	325	39.3	52	9.4	32.7
	Letter, Trainee	471	160	33.9	19	5.8	30.0
	No Letter, Trainee	525	150	28.6	24	6.0	34.4
	Letter, Supervisor	287	175	61.0	38	25.3	37.0
	No Letter, Supervisor	303	175	57.8	28	17.9	31.3

TABLE 6. CORRELATIONS BETWEEN AVERAGE RATINGS FOR DIFFERENT RATING SCALES ON LONG AND SHORT QUESTIONNAIRES

Instrument	Frequency With Criticality	Frequency With Performance	Criticality With Performance
Short Questionnaire	.93	.97	.94
Long Questionnaire	.70	.84	.70

The patterns of average ratings for items on the Performance of Task Upon Arrival From School scale for the long questionnaire and card sort were nearly identical, the correlation between the two instruments for the 134 items being .89. The magnitude of this correlation implies that the differences between average ratings on performance of different items are real differences and not chance occurrences.

Performance ratings for several of the items that were not present in the old Radioman "A" School curriculum were significantly lower than the average Performance rating for all items. For example, item 4 on the long questionnaire, which dealt with reading perforated teletype tapes had an average rating of 2.15 which was significantly lower than the 3.31 overall average rating of Performance ($t = 7.9$, $df = 390$, $p < .001$). In addition, the nine items that dealt with the use of International Morse Code (items 122 through 130) produced an average Performance rating of 2.45, which was significantly lower than the overall Performance average ($t = 7.7$, $df = 390$, $p < .001$).

SHIP/SHORE DUTY STATION DIFFERENCES. The second largest source of variance in the rating scale data was produced by the duty station of the trainee (see table 7). On both the Frequency of Task and Criticality of Task scales significantly higher ratings were found for ship personnel than shore personnel ($t = 11.0$, $df = 658$, $p < .001$ for Frequency; $t = 8.6$, $df = 658$, $p < .001$ for Criticality). However, average ratings on the Performance of Task Upon Arrival From School scale were nearly identical for shore based and shipboard personnel.

TABLE 7. AVERAGE SCALE RATINGS OF SHIP AND SHORE DUTY STATION RESPONDENTS, TRAINEES, AND SUPERVISORS

Respondent	Frequency of Task Scale	Criticality of Task Scale	Performance of Task upon Arrival from School Scale
Shore Duty Station	2.64	3.33	3.18
Ship Duty Station	3.31	3.88	3.19
Trainee	3.02	3.62	3.34
Supervisor	2.95	3.58	3.05

Correlations between shipboard and shore-based personnel for the average item ratings on the different scales of the long questionnaire were .72 for Frequency, .70 for Criticality, and .88 for Performance of Task Upon Arrival From School. The Performance correlation was significantly higher ($p < .05$) than the Frequency and Criticality correlations. The high Performance correlation reflects a high degree of similarity of Performance ratings for the two groups, which would be expected since both received the same training.

The large ship/shore differences in ratings of Frequency for many items correspond to the known differences in the job structure for Radiomen between these different sites. The accuracy of these Frequency ratings was used to evaluate different groups of respondents on their instrument completion performance and these results are discussed later in this section.

TRAINEE-SUPERVISOR DIFFERENCES. As shown in table 7, the overall average ratings on the Frequency and Criticality scales were nearly identical for trainees and supervisors. However, trainees provided significantly higher average ratings on the Performance of Task Upon Arrival From School scale than supervisors ($t = 4.9$, $df = 658$, $p < .001$). Despite this difference, the basic pattern of item ratings was highly similar for the two groups. This similarity was shown in the correlations between trainees and supervisors on the average Performance ratings for items which were greater than .80 for both the long form and card sort and greater than .90 for the short questionnaire.

Some tasks included on the questionnaire are performed very often by Radiomen and some are seldom performed. These tasks were a source of rating differences between the trainees and supervisors, with supervisors tending to give the more extreme Frequency ratings on such tasks. Such items are included in the Frequency-Accuracy Index discussed below. The more extreme Frequency ratings for these particular items corresponded to the known frequencies for these tasks, and supervisors were more accurate than trainees in describing these known frequencies.

CLASS STANDING. Class standing ratings are shown in table 8. Statistically significant differences in average Performance of Task Upon Arrival From School appeared among the different groups. Graduates in the upper third of the classes and their supervisors rated Performance higher than graduates and supervisors of the other two groups. The difference between the upper third and middle third was significant ($t = 3.4$, $df = 462$, $p < .001$), as was the difference between the upper third and lower third ($t = 3.6$, $df = 436$, $p < .001$). The difference between the middle third and lower third was not significant.

TABLE 8. AVERAGE SCALE RATINGS FOR CLASS STANDING GROUPS

Class Standing	Frequency of Task Scale	Criticality of Task Scale	Performance of Task Upon Arrival From School Scale
Upper third	2.99	3.65	3.35
Middle third	2.94	3.57	3.12
Bottom third	3.02	3.58	3.09

TIME LAPSE FROM GRADUATION. There were significant differences in Frequency of Task ratings dependent upon the amount of time lapse from graduation prior to interrogation (table 9). The 4 to 6 month group provided significantly lower average Task Frequency ratings than the 7 to 9 month group ($t = 3.0$, $df = 286$, $p < .01$). In turn, the 7 to 9 month group provided significantly lower average Task Frequency ratings than the greater than 12 month group ($t = 1.7$, $df = 411$, $p < .05$). The trend is clearly one of higher ratings of Frequency of Task with more time lapse from graduation. Differences between these groups on the other scales were not significant.

TABLE 9. AVERAGE SCALE RATINGS FOR TIME FROM GRADUATION GROUPS

Time Lapse Prior to Evaluation	Frequency of Task Scale	Criticality of Task Scale	Performance of Task Upon Arrival From School Scale
4 to 6 months	2.71	3.51	3.27
7 to 9 months	2.99	3.61	3.08
10 to 12 months	3.02	3.66	3.18
More than 12 months	3.12	3.66	3.19

INSTRUMENTS. Rating scale data for the different instruments are presented in table 10. The short questionnaire produced significantly higher average Frequency of Task ratings than the long questionnaire ($t = 5.4$, $df = 461$, $p < .001$). On the Performance of Task Upon Arrival From School scale the average rating from the short questionnaire was significantly lower than the long questionnaire ($t = 5.6$, $df = 461$, $p < .001$). Both of these differences probably reflected the different items that made up the two different instruments and were not related to the length or any other general characteristics of these instruments. The absence of a difference in Performance ratings for the long form and card sort would be expected since both utilized the same 134 items.

TABLE 10. AVERAGE SCALE RATINGS FOR DIFFERENT INSTRUMENTS

Instrument	Frequency of Task Scale	Criticality of Task Scale	Performance of Task Upon Arrival From School Scale
Short Form	3.17	3.68	2.93
Long Form	2.78	3.52	3.31
Card Sort	N/A	N/A	3.32

ITEM ORDER. Average Performance on the normal item order instruments was lower than average Performance on the reversed item order instruments. However, this difference was caused primarily by the significant difference between the average Performance ratings on the normal order (2.79) and reversed order (3.09) short questionnaires ($t = 2.9$, $df = 269$, $p < .01$). The correlation between the normal and reversed forms for Performance ratings of the 15 short questionnaire items was .94, which indicates that despite the difference in level, relationships between items were nearly identical for the two forms. The normal item order and reversed item order versions of the long questionnaire also produced nearly identical data. The correlation between the two versions was .89 for Performance ratings.

TABLE 11. AVERAGE SCALE RATINGS FOR ITEM ORDER, ADMINISTRATIVE PROCEDURE, AND EXPECTATION LETTER CONDITIONS

Instrument	Frequency of Task Scale	Criticality of Task Scale	Performance of Task Upon Arrival From School Scale
Normal Item Order	2.95	3.62	3.12
Reversed Item Order	3.01	3.58	3.27
Single Admin.	2.99	3.63	3.21
Joint Admin.	2.97	3.57	3.16
Expectation Letter	3.00	3.59	3.26
No Expectation Letter	2.97	3.61	3.15

ACCURACY OF FREQUENCY RATINGS. As noted earlier, the overall average Frequency rating was higher for shipboard personnel than for personnel at shore stations. This difference was produced in large part by eight items related to operation of the Fleet Broadcast and by four items related to maintenance performance on communications equipment. Other items such as those related to radiotelegraph operation had been revealed by task analysis to have very low frequencies for both ship and shore personnel. Two items related to security practices were also known to have very high frequencies for both ship and shore personnel as did a number of items have low frequencies of occurrence only for shore-based personnel. From all these tasks with previously ascertained very high or very low frequencies of occurrence for ship personnel, shore personnel, or both, 78 were selected to provide a measure of the relative accuracy of Frequency ratings for different groups and conditions of the study. On each item comparisons were made for pairs of conditions, such as supervisors vs. trainees. If the average Frequency rating was more extreme (and therefore more accurate) for the trainee, he received a one for the item and the supervisor received a zero. This was done for all 78 items and a total score for each condition was obtained, with the condition having the higher number being more accurate.

When average ratings for trainees on these 78 tasks were compared to the average ratings for supervisors, only 21 of the 78 items were rated more accurately by the trainees. The sign test (Siegel, 1956) indicated that significantly more items were rated more accurately by supervisors. (The correlation between trainees and supervisors for the 134 Frequency ratings was .90 for shipboard personnel and .93 for personnel at shore stations. Thus, despite reduced accuracy of responding, trainees still nearly replicated the same inter-item relationships produced by supervisor ratings.)

The joint vs. single administration factor produced a significant difference in the accuracy of Frequency ratings. Fifty-one of the 78 tasks were rated more accurately by persons receiving the long questionnaire jointly with the supervisor (or trainee) than by persons in the single administration condition ($p < .01$, sign test).

Another significant difference in Frequency rating accuracy was found for the lower of the three Class Standing groups. Average ratings for this group were significantly less accurate than the overall ratings on 53 of these 78 items ($p < .01$, sign test). The middle third and upper third groups did not differ between themselves, but average ratings of both were more accurate than overall average ratings on 50 of the 78 items ($p < .01$).

Two of the Time from Graduation groups produced significant differences in accuracy of ratings for these 78 items. The group who received instruments 4 to 6 months after graduation was significantly more accurate than the overall average on 55 of these items ($p < .01$). The group that received instruments 10 to 12 months after graduation was less accurate than the overall average on 53 of these items ($p < .01$). No other differences between groups and conditions in the study appeared for this measure of the accuracy of Frequency ratings.

STRUCTURED INTERVIEW SIMILARITIES AND DIFFERENCES. The patterns of item ratings were nearly identical between the interview and mail-out data, expecially in the case of ship personnel. The correlation between Frequency ratings from the two procedures was .74 for shore-based personnel and .94 for ship personnel. For Criticality ratings, the correlation was .68 for shore personnel and .89 for shipboard personnel. For Performance upon Arrival from School, the correlations were .89 for shore personnel and .92 for shipboard personnel. The lower Frequency and Criticality correlations for shore personnel reflect the somewhat atypical equipment and procedures encountered at the Norfolk Communication Station. As with rating averages, variability of ratings was also nearly identical for persons receiving mail-out instructions and for persons providing data in the structured interviews.

One difference which occurred between ratings for structured interviews and mail-out questionnaires was a greater tendency for the structured interview group to skip the Criticality and Performance scales if the task was "Never Performed." It was difficult to insist that a person make a Performance rating on a task when he (or the person he supervised) had never performed this task on the job. Mail-out questionnaires contained instructions to do this and respondents were generally willing to provide such ratings. In the face-to-face interview, the problem of making these ratings was a shared problem, and the joint decision was often to not make such ratings when there was little or no experience upon which to base them.

TRAINING ADEQUACY INDEX. Tasks with high ratings of Criticality and low ratings of Performance Upon Arrival From School are tasks which are apt to be undertrained. Conversely, tasks are apt to be overtrained if they receive low ratings of Criticality and high ratings of Performance. The 134 tasks of the long questionnaire were examined and those with the largest differences between average Criticality and Performance ratings were identified. Tasks with large positive differences, i.e., greater Criticality than Performance, were classified as undertrained on this Training Adequacy Index. Tasks with large negative differences; i.e., greater Performance than Criticality, were classified as overtrained on this index. This procedure corresponds closely to a technique developed by Siegel, Schultz and Federman (1961) for combining Task Criticality and Task Performance ratings to obtain a measure of training adequacy.

Since training problems in the old Radioman "A" School curriculum centered around the duty-station factor, the procedure was carried out separately for average ratings provided by trainees and supervisors at shore duty stations and for average ratings provided by shipboard personnel.

This procedure indicated four tasks (items 14, 36, 48 and 72 in appendix B) which personnel from both duty stations classified as overtrained, and six tasks (items 74, 75, 102, 103, 123, and 124) which personnel from both duty stations classified as undertrained. Shipboard personnel classified an additional eight tasks as overtrained (items 15, 35, 50, 51, 63, 67, 108 and 115) and an additional eight tasks as undertrained (items 3, 20, 94, 101, 110, 122, 127 and 128). Shore-based personnel classified an additional nine tasks as overtrained (items 40, 41, 43, 45, 46, 47, 82, 83 and 84) and an additional seven tasks as undertrained (items 4, 57, 112, 131, 132, 133 and 134). Agreement of the two duty station groups on only 10 of the 42 items augurs well for the derived Training Adequacy Index, considering the large differences in training needs for the two duty station groups and the fact that the old curriculum was identical for both.

The tasks rated as overtrained by both duty station groups involved those dealing with assignment and recording of date-time groups of messages, delivering messages, and changing teletype paper, tapes and ribbons. Unlike many training tasks which receive little attention in school, these tasks are practiced frequently since they are included in performance of many other training tasks dealing with message handling and teletype operation. For this reason, these tasks are overlearned; i.e., more practice is given on the task after criterion performance has been reached. However, this overlearning is a by-product of other essential training.

Of the items which both duty station groups classified as undertrained, one dealt with rescuing a person from a live circuit, one with first aid, two with distress messages and enemy contact reports, and two with restoring fading communication links. All can be considered emergency situations and at first glance appear to be likely candidates for increased training emphasis. However, no particular increased emphasis is placed on these tasks in the new Radioman "A" School curriculum over that of the old curriculum.

For personnel at shore duty stations the derived Training Adequacy Index indicated overtraining for tasks involving identification of call signs, operation of the Fleet Broadcast (five items), operation of two teletype terminals and operation of a receiver. For the most part these are procedures and equipment that are used primarily aboard ship. Shore-based personnel now do receive much less training emphasis on these items under the new tracking system in Radioman "A" School.

Personnel at shore duty stations classified tasks as undertrained which dealt with reading of perforated teletype tape, operation of the Autodin terminal, conduct of emergency destruction of classified material and five other items related to security practices. Reading perforated tape and Autodin are items in the new Radioman "A" School curriculum that were not included in the training of the persons in our sample. The tasks related to security practices are especially critical for shore installations which usually are in foreign countries. Undertraining is probably the case for these tasks, but since the procedures are generally specific to the particular units, more on-the-job training, not more school training, is indicated.

Items indicated to be overtrained for shipboard personnel included the logging of outgoing messages; identification of duplicate messages, special messages and readdressed messages; distinguishing between ship and shore teletype circuits; and distinguishing among the three major components of a shore communication station. Also included were tasks related to placing tapes in backlog bins, operating a particular reperforator, and painting antennas. All of these "overtrained" tasks except painting antennas are primarily shore-station functions which now do receive much less emphasis in Radioman "A" School for ship-bound trainees. Antenna painting did not receive much attention in "A" School in the past and still does not. The overtraining indicated by the Training Adequacy Index may have been due to the simplicity of the task.

Undertraining was indicated by the index for shipboard personnel for tasks of checking the accuracy of prepared tape, identification of incorrect Naval Activity Short Titles, activating crypto equipment, and use of counter measures and other procedures related to enemy jamming. Short Title identification is a new feature of Radioman "A" School that was not included in the training of our sample. More emphasis is also now given to operation of crypto equipment for shipboard personnel. However, jamming procedures receive less emphasis in Radioman "A" School now than in the past and undertraining indicated by the index may be a "false alarm."

In summary, the derived index provides generally good data on the training problems known to exist in the old Radioman "A" School. Where it fails, it is usually because the overtraining indicated is unavoidable and not a school problem, or because the index does not distinguish between undertraining that is a school problem and undertraining that must be corrected by on-the-job training. The moderate success of this derived Training Adequacy Index speaks well of the reliability and accuracy of the Criticality and Performance ratings from which the index was derived.

OPEN-ENDED QUESTIONS

For all instruments compared in the study, open-ended questions were used to identify missing objectives in the Radioman "A" School curriculum. Six different categories of missing objectives were mentioned: (1) use of publications, (2) perforated tape reading, (3) radiotelegraph procedures (International Morse Code), (4) NAVCOMPARS (computer communication procedures), (5) satellite communications, and (6) voice communications.

The percentages of persons mentioning these items for the different instruments and for different respondent groups are presented in table 12. Three of the six categories of missing objectives have been incorporated in the new Radioman "A" School curriculum and tentative plans are being made to include a fourth (voice communications). Discussions with school personnel indicated that use of publications may also be a bonafide missing objective although, until we reported our results, it was not considered for inclusion in the curriculum. One scale rating which appears to be a "false alarm" by the questionnaire instrument may, in fact, not be. Radiotelegraph procedures are taught in the more advanced communication schools and presumably are related to the jobs of higher rated personnel. Since these procedures were targeted as missing training, it indicates that some "A" School graduates are being placed in work situations requiring that skill.

A high percentage of persons receiving structured interviews indicated the task of reading perforated teletype tape as a missing training objective. These responses were mainly from personnel at Naval Communication Station Puerto Rico where this task is frequently performed. This item was largely responsible for the greater average number of missing objective comments for the structured interview group. However, none of the differences among instruments was significant nor was the difference between supervisors and trainees.

The short questionnaire depended on open-ended questions to identify specific areas of undertraining and overtraining. Twenty different tasks received mention as being undertrained. The most frequently mentioned item was crypto equipment with 15 percent of respondents on the short questionnaire reporting it as undertrained. The least frequently mentioned item was first aid which was mentioned by only one percent of the short form respondents. Tasks mentioned by five percent or more of respondents typically were indicated by other sources to be tasks that were undertrained. These sources included the changes in the old curriculum for the task and also data from the derived Training Adequacy Index discussed previously. When an item was mentioned by fewer than five percent of respondents, the other sources usually indicated adequate training or even overtraining for the item. First aid was one of the areas that the derived Training Adequacy Index indicated to be undertrained, yet only one percent of respondents mentioned this item. It is not clear whether this reflects on the open-ended question as a source of information on undertraining, on the derived Training Adequacy Index, or on both.

Significantly, fewer comments were provided about overtraining than were made about undertraining. The only area mentioned as overtrained by more than three respondents was shipboard equipment and systems. Since practically all of these overtraining comments came from shore

TABLE 12. PERCENTAGE OF RESPONDENTS INDICATING MISSING OBJECTIVES ON OPEN-ENDED QUESTIONS FOR DIFFERENT INSTRUMENTS AND GROUPS

Reported Missing Objectives	Structured Interview	Long Questionnaire	Card Sort	Short Questionnaire	Supervisor	Trainee
	N=96	N=196	N=197	N=267	N=387	N=369
Publications	5	9	12	12	19	5
Tape Reading	29	10	7	14	8	17
Radiotelegraph	7	4	2	6	6	1
NAVCOMPARS	4	2	2	3	3	2
SATCOM	1	2	2	1	2	0
Voice Communication	2	2	2	6	4	3
Average Percent per Item	8.0	4.8	4.5	7.0	6.8	4.9

installations, these comments appear to be valid. Again, only a small percentage (eight) mentioned this item, but it is indicative of the sensitivity of the instrument.

FOLLOW-UP LETTERS TO RESPONDENTS AND NON-RESPONDENTS

To obtain opinions from Fleet personnel regarding this particular feedback effort and about the process of obtaining feedback information by the schools, follow-up letters were mailed to the 1026 trainees and supervisors who had not returned the questionnaire and to the total sample of 600 trainees and supervisors who had responded. Only 145 letters to non-respondents were returned. An analysis of the reasons given for not returning the feedback materials indicated that the Radiomen considered the materials too long (15 percent of returned letters, mostly from trainees), did not receive the materials (18 percent), lost the materials (10 percent), did not feel qualified to evaluate "A" School (11 percent), did not understand the questionnaire (5 percent), were transferred (6 percent), and did not use Radioman "A" School training (9 percent). It is interesting to note that 59 percent of those reporting that they either did not receive or lost the materials were mailed the long questionnaire. This is significantly different than the 33 percent that would be expected by chance ($z = 6.1$, $p < .001$).

Of the 600 follow-up letters mailed to respondents, 175 were returned. A number of trainees receiving the materials within the time frame of 10 or more months following graduation from school indicated difficulty in remembering the school curricula and generally concurred that the evaluation should be conducted sooner after graduation (23 percent). In addition, 27 percent of the respondents felt that the evaluation forms should be tailored to the tasks required at ship and shore duty stations. Some supervisors (5 percent) expressed doubt as to their ability to evaluate the trainee based on the "A" School curriculum or to remember trainee performance upon arrival at the job site.

The remaining trainees and supervisors indicated no problems in completing the materials. A number of personnel indicated their pleasure at being asked for their opinions and complimented the format (11 percent). Some respondents indicated a desire to receive feedback on the results of this study and future evaluations.

A small number of respondents indicated that they did not appreciate the criticality of the return of evaluation materials until they received the follow-up inquiry. Such comments support the importance of an expectation letter, in order to insure that the respondent understands the value of his input to the training cycle.

SUMMARY OF RESULTS

RETURN RATE DATA.

- Return rate for supervisors was almost double that for trainees (59.3 percent vs. 31.1 percent).
- Return rate following reminder letters was greater for supervisors than trainees (21.6 percent vs. 5.9 percent).
- Return rate for the short questionnaire was greater than for the long questionnaire or card sort (48.9 percent, 37.3 percent, and 38.2 percent, respectively).
- Time until return of questionnaire was longer for the long form than for the short form and card sort (38.8 days, 30.7 days, and 33.2 days, respectively).
- For trainees, the return rate for the short form was greater than for the long form or card sort (40.0 percent, 25.3 percent, and 27.7 percent, respectively).
- The group 4 to 6 months from graduation yielded the lowest return rate for the time from graduation groups (4 to 6, 35.3 percent; 7 to 9, 41.2 percent; 10 to 12, 45.5 percent; greater than 12, 43.8 percent).
- Trainees graduating in the Upper third and Middle third of their classes had a higher return rate than the Lower third (35.1 percent, 33.3 percent, and 23.9 percent, respectively).
- The group receiving "Expectation Letters" had a higher return rate than those who did not receive them (44.4 percent vs. 39.0 percent).

RATING SCALE DATA.

- Correlations between rating scales were higher for short forms:

Short Form	Long Form	Variable
.93	.70	Frequency with Criticality
.97	.84	Frequency with Performance
.94	.70	Criticality with Performance

- Higher ratings were given for shipboard personnel than for shore-based personnel on both Frequency and Criticality of Task scales (due largely to the inclusion of more tasks specific to shipboard duties on the instruments).
- Average ratings for the Performance of Task Upon Arrival From School scale were nearly identical for shipboard and shore-based personnel.
- Correlations between shipboard and shore-based personnel for the Frequency, Criticality and Performance scales were .72, .70, and .88, respectively.
- Overall average ratings for trainees and supervisors were nearly identical on the Frequency and Criticality scales.
- Trainees rated their own Performance higher than supervisors rated this performance, but the basic pattern of ratings across tasks was similar. The correlations between the Performance ratings of the two groups was greater than .80 for both the long form and card sort and greater than .90 for the short questionnaire.
- Trainees graduating in the Upper third of their classes and their supervisors rated trainee Performance higher than graduates (and their supervisors) from the Middle and Lower groups.
- The correlation for average Performance ratings on the short form between normal and reversed item formats was .94.
- The correlation for average Performance ratings on the long form between normal and reversed item formats was .89
- Supervisor ratings of Frequency were more accurate than those of trainees.
- Average Frequency ratings were more accurate under the joint administration condition than under the single administration condition.
- Trainees in the lower third of their graduating classes were less accurate in their Frequency ratings than trainees in the Upper and Middle thirds.
- The group 4 to 6 months from graduation gave more accurate Frequency ratings than other groups.
- The group 10 to 12 months from graduation gave less accurate Frequency ratings than other groups.

- A Training Adequacy Index based on Criticality of Task and Performance of Task Upon Arrival From School, accurately identified many tasks which were previously known to be overtrained or undertrained.

OTHER FINDINGS.

- Open-ended questions identified training objectives that were missing from the old curriculum that have been included in the new curriculum.

- Follow-up inquiries elicited the following major information:

59 percent of those reporting loss or non-receipt of questionnaires were mailed the long form. Only 33 percent would be expected by chance and the difference was highly significant.

Of those who expressed difficulty completing the short form, 23 percent expressed an inability to remember the school curriculum as a reference point.

A number of respondents expressed a desire that future feedback questionnaires be specific to either ship or shore duty requirements (27 percent).

SECTION IV

DISCUSSION AND CONCLUSIONS

The most compelling aspect of the results of this study was the consistent patterns of average item ratings that were found on the scales of Frequency of Task, Criticality of Task, and Performance of Task Upon Arrival From School. Similar patterns were produced by each group of respondents and with each administration procedure. None of the product-moment correlations calculated between different groups and between administration procedures was less than .70 and many were .90 or more. This high reproducibility of average item ratings occurred even for groups in which the number of respondents was 50 or less.

Not only were the average ratings for tasks on the different scales highly reliable, but they corresponded to the differences that were known to exist prior to questionnaire administration in frequency, criticality, and trainee performance for these tasks. The large ship-shore differences in task frequency, which were the basis for the recent major curriculum modification of Radioman "A" School, are accurately reflected in the Frequency ratings. Shipboard tasks were indicated as "Never Performed" by nearly all shore-based personnel and, similarly, tasks known never to be performed by shipboard personnel were indicated as "Never Performed" by nearly all shipboard respondents. This result indicates that, with very few exceptions, respondents completed the questionnaires with much care.

Performance ratings, like the Frequency ratings, reflected the real-world situation. The ability to read perforated teletype tapes is important for many shore-based personnel, but this task was not yet included in the curriculum of those persons interrogated in our study. Performance of Task Upon Arrival From School ratings were found to be very low for this task. Items related to International Morse Code use also were given very low Performance ratings and this, too, was expected since Code training was not (and is not) included in Radioman "A" School. Highly significant differences appeared between items on the Criticality scale and some of the highest Criticality ratings occurred for tasks dealing with first aid and with security practices. These ratings on this scale appear to be highly valid responses as well.

Differences that existed for average ratings among different groups of the study also indicate the validity of the rating scale data. A direct relationship appeared between ratings of Performance of Task Upon Arrival From School and the three Class Standing groups. Performance of Task Upon Arrival From School was rated highest for the upper one-third and was rated lowest for the lower one-third. The frequency of task performance typically increases as trainees gain more experience and Frequency ratings showed significant increases for groups with longer time from graduation. This finding also indicates the validity of these average ratings.

The high reliability and high validity of the present rating scale data indicate that mail-out questionnaires can provide excellent data that can serve as a means for identification of training problems. This finding is contrary to an expectation that developed early in the study that only expensive face-to-face interviews with personnel of operational units could provide effective data for these purposes. This bias was generated by a number of published and unpublished studies which reported unsuccessful results using mail-out questionnaires (e.g., TAEG Report No. 12-1; 1973). With minor modifications, questionnaire format and administration procedures used in this study appear to be applicable to most, if not all, Navy training situations. The questionnaire and procedures are described in Section V of this report and are described in more detail in a procedure manual which is being published separately as TAEG Feedback Manual (June 1975).

The structured interview technique, which elicited our initial faith, was also examined in the present study but, as reported earlier, no basic differences between the structured interview and long questionnaire were found in the ratings of job tasks or in the responses to the open-ended questions. In fact, the highest correlation found in the study was between Performance ratings on the long questionnaire and Performance ratings on the structured interview (.94). Variability of item ratings also did not differ between ratings obtained from structured interviews and those obtained in the mail-out questionnaire (long form). The similar variability of item ratings indicates that one returned questionnaire is equivalent to one structured interview. Although the structured interviews enabled the gathering of information that was not specifically requested in the questionnaire, this information could have been obtained by mailing a second questionnaire. The structured interview should be used during the development of the mail-out instrument. Interviews could be conducted with training personnel, especially those personnel recently assigned from operational units. This will allow identification of questionnaire ambiguities, and identify additional useful information that should be requested in the questionnaire (see section V).

As was noted earlier, statistically significant differences were found in the accuracy of ratings for different respondent groups and for different procedural conditions in the present study. However, despite these differences, very high correlations existed between ratings of more accurate and less accurate groups. For this reason, only the largest difference in rating accuracy, which appeared between supervisors and trainees, would influence these procedures for obtaining post formal training feedback. Trainee/supervisor differences in ratings for an item often occurred due to ambiguous task descriptions or because a piece of equipment was identified by model number (e.g., AN/SRC-20) or other name that conveyed little information about it or its use. Under these circumstances, supervisors were more apt than trainees to give Frequency ratings that were consonant with the known frequency of performance of the task. This result implies that more weight should be given to supervisor ratings on task items when these ratings differ from those of the trainee. The appearance of trainee/supervisor differences for ratings on a task may also indicate that the item requires revision prior to the next series of mail-out questionnaires.

The large differences in return rate among the different types of mail-out instruments were directly related to the length of the instrument. Follow-up letters sent to persons who did not return the long questionnaire often were returned with the "Questionnaire was too long" category checked. The advantage of the short questionnaire was particularly striking for trainees. More than one and one-half times as many short forms than long forms were returned by this group. For supervisors, only 10 percent more short forms than long forms were returned. These return rate differences between long and short instruments were closely paralleled by differences in time to return these instruments, with more time required for return of the long form.

Although the return rate was higher for the short questionnaire, much less information about training problems resulted from this instrument. Often, the general objectives listed in the short form were rated as having "Adequate" performance whereas on the long form some enabling objectives subsumed under the general objective were rated "Substantially Inadequate." To a limited extent, the lack of specificity of the short questionnaire was compensated for by open-ended questions which were included to uncover specific problems. However, such a small fraction of respondents mentioned any particular problem that it is difficult to assess the extent of the training problem. With the long questionnaire, the specific item is rated by all respondents and the training problem appears prominently against the background of non-problem items.

Considering the difficulties in identifying specific problems with the short questionnaire, it appears that the factor of nine that was the ratio of items between the long and short forms (134/15) also described the ratio of information provided about training problems. Other evidence for the poor information source of the short questionnaire was the near perfect correlation between scales on the short forms (see table 6). This indicated that no more information was communicated by ratings on all three scales than was communicated by ratings on any one of the scales.

No differences appeared between the normal-item-order long questionnaire and the reversed-item-order long questionnaire. In fact, the correlation of .90 between Performance ratings on these two forms was one of the highest correlations that appeared in the study for the Performance scale of the long questionnaire. This indicates that questionnaire accuracy was constant or nearly constant throughout all 134 items, and that even longer questionnaires can be used, if necessary, to provide training feedback.

As was noted in the previous section, the differences in return rate between trainees and supervisors were large with nearly twice as many questionnaires returned by supervisors as by trainees. The higher return rate of the supervisor may reflect the fact that poor training places a large burden on him. The readiness of his unit is reduced by a poorly trained person and he must take much of his time to bring this person "up-to-speed." The higher return rate may also be due to the fact that the supervisor is more accustomed to administrative tasks and that he has more time than the trainee for "paperwork." Despite this large difference in return rate between trainees and supervisors, strong reasons exist for including both the trainee and supervisor in post formal training feedback. The trainee has a more up-to-date knowledge of the existing training in school and has direct knowledge of his own performance capabilities for job tasks. In theory, at least, he can provide more accurate data than the supervisor on certain training problems. Another reason for interrogating both groups is that supervisory personnel are often already burdened with a great deal of paperwork, and sharing the feedback load between supervisors and trainees will relieve some of the supervisor's workload. The post formal training feedback task will thus be less onerous for Fleet personnel.

Since the "expectation" factor improved the return rate for trainees, the practice of mailing advance letters to trainees should be followed in any initial effort for obtaining feedback information. However, a better procedure for the continuing feedback effort would be to discuss the feedback function with the student prior to his departure from school. The materials could also be shown and explained to him at that time, but the materials should not be sent with him to the duty station. Discussions with training personnel indicate that sending the materials with the trainee to his new duty station has often resulted in very low return rates. For this reason, the evaluation materials should be sent at the time they are to be completed. Since the return rate from supervisors was increased only slightly by advance notice, the "expectation" letter for supervisors can be omitted.

Joint administration (both the trainee and his supervisor) produced a higher return rate than single administration which was accompanied by higher accuracy and more comments. Although these features augur well for a policy of joint administration, they are countered by information gleaned from follow-up letters to trainees responding in this joint administration mode. In several instances, there were clear indications that the trainee had actually filled out both his questionnaire and that of his supervisor. The fact that some trainees revealed this information could mean that numerous trainees were required to fill out the supervisor's form. For this reason, either the supervisor or the trainee should be contacted, but both should not be contacted unless the number of graduates in a school is small and both are needed to provide reliable information. If the trainee fills out the supervisor's form in such single administration (or vice versa), duplicate information will not be collected.

Return rate differences were small for groups who had different time periods from graduation prior to the mailing of questionnaires; therefore, this measure provides little basis for selecting one time period over another. However, follow-up letters to persons who were more than nine months from graduation prior to interrogation often indicated that the respondent believed he should have received the materials earlier. Early interrogation also allows for earlier identification and correction of problems. Some minimum time, however, is required on the job to enable the trainee to evaluate his performance; to determine the adequacy of his training for this performance; and for the supervisor to evaluate the trainee's performance. Probably three months would be an optimum balance of these different factors. However, in the Navy, many graduates spend the first three months of their tours mess-cooking or on other details unrelated to their training. In addition, leave often occurs after school and prior to assignment to the duty station. All of these factors taken together indicate an optimum period of between five and seven months following graduation prior to interrogation.

The novel and easy card-sort response required for the mail-out card-sort instrument was expected to produce a high rate of return; however, the data did not support this expectation. Although slightly higher than the return rate for the long questionnaire, the difference in return rate (1 percent) was too small to argue for adoption of this instrument and procedure. Even though the card-sort method successfully produced data about Trainee Performance Upon Arrival From School, which corresponded closely to that of the long questionnaire (r=.89), it provided only partial data on Task Frequency and none on Task Criticality. If additional scales such as Task Frequency or Task Criticality had been included, sorting of cards would have become a cumbersome task and this would negate the expected advantage of the easy response. Ambiguous task statements tended to cause more problems with this instrument than with the long questionnaire. This suggests that the response of card-sorting sometimes occurs without enough time taken for analysis and reflection. For these reasons, the card-sort technique is not recommended for general post formal training feedback purposes.

Having both Criticality of Task and Performance of Task Upon Arrival From School scales on the short and long questionnaires provided an opportunity to calculate a derived Training Adequacy Index. This involved subtracting the Criticality ratings for an item from the Performance ratings for the same item. Items with high Performance ratings and low Criticality ratings thus received large values and items with low Performance ratings and high Criticality ratings received small values on this derived scale of Training Adequacy. A similar procedure has been used by Siegel, Schultz, and Federman (1961) to identify overtraining and undertraining in four Navy ratings. When this procedure was applied to data from the long questionnaire, it assisted in the identification of areas of known undertraining and, to a lesser extent, areas of known overtraining. However, in structured interviews, items which had the derived characteristic of "undertraining" often did not elicit a similar response from the interviewee when he was directly asked if more school training was needed for the task. An example of this was the item "Conduct emergency destruction of classified material" which persons interviewed face-to-face almost unanimously believed was best learned on the job. Conversely, some areas where the derived score indicated overtraining, were not judged as overtrained in school when the question was asked (e.g., "Changing teletype tapes and ribbons"). Since the respondents in the interviews could readily express opinions on training adequacy for a task, and since these opinions were often largely independent of their Criticality and Trainee Performance ratings, it is important that both trainees and supervisors be asked to directly rate the adequacy of training rather than to rate the two factors of Criticality and Performance of Task Upon Arrival From School. However, retention of the Frequency scale is recommended to aid in identifying obsolete equipment and tasks. The relatively easy rating of Task Frequency may also serve the function of getting the item solidly into consideration by the respondent prior to the more difficult rating of Training Adequacy. We expect that the Frequency rating will not inaccurately bias the rating of Training Adequacy.

Open-ended questions were used for two different purposes in the instruments administered. For both long and short questionnaires, they were included to elicit new material that should be included in the school curriculum. Our recommended instrument and procedure also utilizes an open-ended question for this purpose since it is critical that a way be provided for identifying new training needs. For example, material that is just now being integrated into the Radioman "A" School curriculum was mentioned as missing from the curriculum by about three percent of the respondents. This implies that consideration must be given to ideas for new training if only a small percentage of persons report it. The other purpose of open-ended questions was to get at the specific problems the short questionnaire could not identify with the rating scales. As was mentioned, the success of this procedure was limited and we recommend the use of a long form which mentions the specific situations, thus allowing all respondents to make judgments on possible training problems.

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SECTION V

RECOMMENDED FEEDBACK INSTRUMENT AND PROCEDURES

The long questionnaire used in the present study accurately identified the known problems of the old Radioman "A" School curriculum and provided almost identical data to that obtained from more expensive face-to-face interviews. For these reasons, it is recommended that such mail-out questionnaires, based on specific job tasks, be adopted throughout the Navy as the major method for obtaining post formal training feedback. This section describes the recommended instrument and procedures which are modified forms of the highly successful instrument and procedures used in the present study and described earlier in this report. The modifications make the instrument even more effective and simplify its administration and use.

The proposed feedback/curriculum revision cycle requires 18 months plus the duration of the training course. In addition, initial instrument development may take from one to five weeks with the longer time required if job task statements do not already exist and the existing curriculum must be converted to descriptions of the job behaviors for which the school provides training.

A minimum number of personnel would be required to develop these instruments and carry out these procedures. It would probably not require the full time of one person involved with curriculum development except during the initial instrument development stage and the data analysis phase which occurs after all questionnaires have been returned. Typing, printing, and clerical services will be required for brief periods. Once the data are analyzed, the resultant information on training problems would be fed into the normal curriculum revision process and the person who develops and administers the instrument would then be free to devote full time to this revision process.

The recommended procedures are generally straightforward and require no particular skills or training of the person assigned to carry them out. However, if this person enjoys data tabulation and manipulation, so much the better. A companion report (TAEG Feedback Manual, June 1975) is written for use by relatively unsophisticated training personnel to enable them to prepare and administer the instruments and to analyze and use the data.

FORMAT AND PREPARATION OF FEEDBACK QUESTIONNAIRE

The basic form which will make up the bulk of the questionnaire, is the next to last page of each of the questionnaires presented in appendixes J and K. It includes brief instructions, space for eight job tasks, and two scales on which each of the items are to be rated by circling a number from one to five. (If optical scoring is available, numbered, dotted parallel lines could be substituted for these numbers.) The "Frequency of Task" scale is nearly identical to that used in the present study. No respondent reported any particular difficulty with this scale. However, respondents often felt it difficult to rate a task on the Criticality and Performance scales if they had marked the task as "Never Performed" on the Frequency scale. In fact, despite instructions not to do so, they often skipped these other scales rather than make what they believed to be inappropriate estimates about the criticality of the task and the trainee's ability to perform the task. On the new form, the respondent is given the option of skipping the Adequacy of School Training for This Task scale if the task is rated as "Never Performed."

The Adequacy of School Training for This Task scale differs from the previous instrument which asked for Criticality of Task and Performance of Task Upon Arrival From School. As was mentioned in the previous section, it is expected that this will provide more useful data since structured interviews often indicated that supervisors and trainees made judgments about the adequacy of school training which were relatively independent of their ratings of Criticality of Task and Performance of Task Upon Arrival From School.

We recommend the basic job task form be used without change. Enough copies of this form should be reproduced to accommodate all of the specific job tasks to be included in the questionnaire. These job task statements should be written in terms of observable behavior. If a job task analysis has been conducted, these statements will already exist and preparation of the main body of the questionnaire can be done very quickly. Before final typing, however, it is essential that several persons at the training unit, such as recent school graduates, instructors and recent transfers from operational units, read these items to help identify any possible problems that might produce misinterpretations of the task statements. We suggest that these persons be asked to rate Task Frequency and Training Adequacy for each of these items in a structured interview similar to that which was conducted in the present study.

If job task statements are not available, the preparer of the instrument must convert areas of the existing curriculum into such task statements. This conversion of a curriculum to task statements will add much time to questionnaire development and will require even more structured interviews with personnel for the purpose of editing task statements prior to typing the final form of the questionnaire.

In most circumstances, supervisors will receive 125 questionnaires similar to the one in appendix J, and another 200 questionnaires (appendix K) will be mailed to trainees. Cover letters and biographical data sheets for these questionnaires should be modified from the forms in the appendixes to suit the needs and purposes of each training activity. One critical feature that should be retained in the cover letter is a deadline for return of the instrument. It is hoped that the instructions and open-ended questions can be reproduced directly from these appendixes without modification.

If the number of task statements exceeds 200, two different questionnaires should be made, with each containing half of the statements. This now will require twice as many persons to be sampled in order to obtain information about the course.

ADMINISTRATION PROCEDURES

If more than 325 trainees graduate in a six-month period, then 200 of these should be selected randomly from the graduation rosters of the last six months for mailing of trainee questionnaires and 125 should be randomly selected for supervisor questionnaires. The randomization is important since it will minimize biases in the questionnaire data which might arise from improper sampling of different ability groups, or different duty stations. The above numbers are predicated on the assumption that less than 200 task statements are used on one questionnaire. If two questionnaires are used, twice as many persons (if available) will be needed in each of the above groups.

The questionnaires should be mailed six months after graduation, with one month or more leeway. The supervisor forms should be mailed to the Commanding Officer at the trainee's duty station with instructions to forward the form to the "Supervisor of Seaman (Name)." The trainee form can be mailed directly to the trainee at his duty station. Both letters should include a self-addressed envelope for return of the completed questionnaire. Two weeks prior to mailing the questionnaire to a trainee, the trainee should be sent a letter that alerts him to the imminent arrival of the questionnaire and its purpose, and that requests him to consider the adequacy of his training during the waiting period.

If the trainee does not return his completed form within one month after mailing, a reminder letter (appendix L) should be mailed directly to him and not to his Commanding Officer. No reminder should be sent to the supervisor who does not return the questionnaire since he may have recently returned one for another graduate (see cover letter in appendix J). Only the supervisor questionnaires will be mailed to the Commanding Officer and this will reduce handling of materials by personnel at operational units. Every effort should be made to minimize the burden that post formal training feedback places on persons in supervisory and command positions since they often are already flooded with paperwork.

With an abundance of graduates, it would be possible to mail more questionnaires than the initial 200 to trainees and 125 to supervisors. This should be done if it becomes apparent that the return will fall considerably short of the goal of 75 trainee forms and 75 supervisor forms. If less than 325 trainees graduate in a six-month period, then at least some forms can be mailed to both the trainee and his supervisor, thereby increasing the number of returned questionnaires. With less than 200 graduates, all trainees and all supervisors of the trainees could be sampled. This should result in more returned questionnaires for supervisors than for trainees, but this imbalance is less important than obtaining the 150 returned forms needed to provide reliable, representative data on the rating scales. If the school has a very small number of graduates, the period of interrogation can be extended from six months to a year or longer in order to build up a satisfactory number of returned questionnaires. In addition, more intensive follow-up procedures (e.g., phone calls, a second questionnaire, contact of supervisors) can be used to obtain returned questionnaires.

The sample of graduates should be selected from graduating classes over a six-month period. One reason is that temporary school problems will not have as much influence in the results. Also, over a short period of time an unrepresentative sampling of duty stations could easily occur. Another advantage of a six-month interrogation period is that it greatly reduces the workload involved with mailing questionnaires and recording the returned data. Only about eight expectation letters, 13 questionnaires and five follow-up letters would need to be mailed each week and only data from about six returned questionnaires recorded. This would require a small amount of time and allow opportunity for checking the outgoing materials and insuring that they are free of defects.

PROCEDURES FOR ANALYSIS AND UTILIZATION OF QUESTIONNAIRE DATA

A notebook should be prepared with a page for each item on the questionnaire. This page could take the form of the example in appendix M, which has space for maintaining separate records for Trainee Frequency and Training Adequacy and Supervisor Frequency and Training Adequacy. When a questionnaire is returned, an identification number should be assigned to it. This identification number can be written on each item page in the columns that correspond to that person's ratings on Frequency and on Adequacy. Any comments which are written regarding training for an item should be written on the back of the particular notebook page for that item and the identification number included to identify the origin of the comment. When a returned questionnaire has a response to the open-ended question asking for new material that should be included in the curriculum, a new page for the notebook should be made on which this response is written along with the identification number of its author. A separate page should be added for each new item mentioned. As future questionnaires arrive that also mention this item, their identification numbers should be added to this page.

After all questionnaires have been mailed and follow-up procedures fail to produce more returns, and if the number returned are at least 50 for the trainees and 50 for the supervisors (if less, mail more questionnaires), the data analysis may begin. Separate statistical means should be calculated for each item for trainee ratings of Frequency, trainee ratings of Training Adequacy, supervisor ratings of Frequency, and supervisor ratings of Training Adequacy. The numbers of Training Adequacy ratings will differ somewhat across pages (items) because of the option respondents have of skipping that scale. It is important to calculate the mean with the actual number of ratings given for the item and not with the total number of trainees or supervisors who returned questionnaires.

In addition to these four means, an additional mean should be calculated for each item sheet which is the average of the average rating of Training Adequacy for all trainees and of the average rating of Training Adequacy for all supervisors. After this "overall rating of Training Adequacy" has been calculated for all items, the pages for the items should be reordered with high values of this average at one end and low values at the other.

The 10 percent of items at each end of this reordered stack are prime candidates for an investigation of training and possible curriculum revisions. Unless other factors argue very strongly against it, those items which are closest to the "task requires much more emphasis in school" end of the Adequacy of School Training scale should be allotted more training emphasis. Similarly, the items which are closest to the "greatly reduce or eliminate training for this task" end of the scale should have the time and other resources given to their training reduced. When reduced training emphasis is recommended and ratings of Task Frequency indicate a very low rate of performance, the situation is probably one of irrelevant training. More drastic curriculum changes may be called for than in the overtraining condition where reduced training is recommended but frequency of performance of the task is moderate or high.

Many factors operate to bring average ratings of Training Adequacy toward the midpoint of the scale and average ratings of highest and lowest items may differ by only a little more than one point. This should not be used as an excuse to refrain from curriculum revision. The standard error of an average of 150 item ratings will be less than .1. If scales were marked randomly, the chances of a difference of one scale unit or more between highest and lowest items would be less than one in one thousand. Thus, the differences in average Training Adequacy between the top and bottom 10 percent of items can be assumed to be real differences and not chance occurrences. Unless the school is an exceptional one, most items falling within the 10 percent margins can and should be acted upon. If personnel and time are not available to correct training for all of the top and bottom 10 percent of these items, those with the most extreme average ratings of Training Adequacy should be attended to first.

A factor that might countermand the recommendations of these average Training Adequacy ratings would be if a very large percentage (perhaps 70 percent) of the total sample skipped the Training Adequacy scale for the item. Under such circumstances where a task is performed by very few graduates, a recommendation to greatly increase training emphasis would be suspect. Other factors that could counter Training Adequacy recommendations would be feedback data from other sources. If equipment breakdowns are numerous for a piece of equipment, an average Training Adequacy recommendation to reduce maintenance training for the item would require much consideration before implementation. Generally, however, the Fleet personnel are as much aware of these other factors as training personnel, and in most instances, these average ratings of Training Adequacy can be heeded. In any curriculum modification, the comments and recommendations included with item ratings should be given much consideration.

Job tasks recommended for addition to the curriculum may be included if enough persons (perhaps 10 percent of respondents) recommend them and other sources agree to this need. A small percentage such as this can be acted upon since many other persons would agree to the need but did not think of it at the time of questionnaire completion. Other, less verifiable, recommendations can be included in the revised questionnaire to be used in the next round of evaluations to determine whether or not they should indeed be added to the curriculum.

Ideally, the revisions should be made and the new curriculum implemented within six months following the analysis of questionnaire data. Whatever the period required for curriculum revision, the field evaluation process can be repeated beginning six months after the first trainees graduate from the new curriculum. During this six months between graduation and questionnaire mailing, the questionnaire can be brought up-to-date to include new material added to the curriculum and material under consideration for future use. As classes graduate, the randomization process can begin to select persons who are to receive questionnaires six months later. If possible, persons selected to receive trainee forms should be shown the questionnaire and made aware that they will be expected to respond to the inquiry.

After six months of questionnaire mailings and when it is determined that no more questionnaires are forthcoming, the data analysis and curriculum revision process can begin again. This cycle of six-months of mail-out interrogation--six months of data analysis and curriculum revision--duration of revised course--six months of feedback questionnaire revision and respondent selection--back to six-months of mail-out interrogation, will take 18 months plus the duration of the training course. For most Navy courses, the time period would be slightly less than two years between mail-out interrogations. With today's rapidly changing Navy, this period almost guarantees that a new set of training problems will be ready for identification.

In addition to the indications of need for training change resulting from these mail-out instruments and procedures, internal sources of training problems will also be providing input to the curriculum revision process. Presumably much agreement will exist between the recommendations from both sources. Only the data from the Fleet, however, can establish for certain that a training objective is being adequately met, and, perhaps of more importance, only this data can indicate whether existing training objectives are appropriate ones.

SUMMARY OF RECOMMENDED PROCEDURES

- A long questionnaire, based on specific job tasks, is recommended for obtaining feedback data in all Navy schools.

- Ratings should be obtained for each specific job task on the frequency of the task and the adequacy of school training for the task.

- An open-ended question should be included to get at missing training objectives.

- Questionnaires should be mailed to both trainees and supervisors.

- The sample to be tested should be selected randomly from all graduates over a six-month period.

- Questionnaires should be mailed six months after graduation.

- Enough questionnaires should be mailed to obtain 75 returned from trainees and 75 returned from supervisors.

- Questionnaires for supervisors should be addressed to their Commanding Officers.

- Questionnaires for trainees should be mailed directly to the trainee.

- Trainees should be notified that they will receive feedback questionnaires. This can be done by mail or, more economically, while they are still in school.

- Follow-up procedures should be initiated one month after mailing of the questionnaires in order to increase the return rate.

- Average ratings of Frequency and Adequacy of School Training for Tasks should be calculated for each questionnaire item.

- At least the top 10 percent and bottom 10 percent of the tasks with extreme average Adequacy ratings should be reviewed and a revision of the curriculum made where necessary.

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APPENDIX A

FIFTEEN GENERAL TASKS OF SHORT QUESTIONNAIRE

FIFTEEN GENERAL TASKS OF SHORT QUESTIONNAIRE

1. TYPE MESSAGES ON A TELETYPEWRITER KEYBOARD USING THE TOUCH TYPE METHOD.
2. PREPARE TELETYPE TAPES OF MESSAGES WITH ROUTING INDICATORS FOR TRANSMISSION IN AUTODIN FORMAT OR MODIFIED ACP 126 FORMAT.
3. PROCESS OUTGOING MESSAGES.
4. PROCESS INCOMING MESSAGES.
5. MAINTAIN COMMUNICATION MESSAGE FILES.
6. OBSERVE SAFETY PRECAUTIONS WHEN WORKING WITH ELECTRONIC EQUIPMENT.
7. SELECT, SET UP AND PATCH TELETYPE AND VOICE EQUIPMENT.
8. RESTORE MALFUNCTIONING SUB-SYSTEMS TO NORMAL OPERATION.
9. PERFORM PLANNED MAINTENANCE SUB-SYSTEMS ACTIONS.
10. OPERATE A FLEET MULTICHANNEL BROADCAST.
11. OPERATE SHIP-TO-SHIP AND SHIP-TO-SHORE TELETYPE CIRCUITS.
12. OPERATE THE AN/FYA-71 (V) DSTE AUTODIN TERMINAL.
13. OPERATE THE AN/FGC-73 (V) MULTIPLE ADDRESS PROCESSING UNIT.
14. EFFECT DISTRESS COMMUNICATIONS USING THE RADIOTELEGRAPH MODE OF OPERATION.
15. MAINTAIN SECURITY OF CLASSIFIED MATERIAL AND COMMUNICATION.

APPENDIX B

134 SPECIFIC TASKS OF LONG QUESTIONNAIRE

134 SPECIFIC TASKS OF LONG QUESTIONNAIRE

1. TYPE PRELIMINARY CALLS AND OTHER TRANSMISSIONS ON A TELETYPE KEYBOARD, USING THE TOUCH TYPE METHOD.

2. CUT TELETYPE TAPES OF MESSAGES DESTINED FOR TRANSMISSION IN EITHER AUTODIN OR MODIFIED ACP-126 FORMAT.

3. CHECK THE ACCURACY OF PREPARED TAPE.

4. READ PRECUT TELETYPE TAPES CONTAINING NO PRINTING ON THE TAPE.

5. CORRECT PRECUT TELETYPE TAPES.

6. CHECK THE TAPE HEADING BETWEEN FORMAT LINE FOUR AND EOM.

7. PREPARE TAPES FROM ORIGINATOR'S ROUGH DRAFTS.

8. PREPARE HEADER REQUIREMENTS.

9. IDENTIFY COMMAND, COLLECTIVE, CONJUNCTIVE AND GEOGRAPHIC ADDRESS GROUPS.

10. COMPLY WITH UNIT'S OPERATIONAL CHAIN OF COMMAND WHEN PROCESSING MESSAGES.

11. COMPLY WITH UNIT'S ADMINISTRATIVE CHAIN OF COMMAND WHEN PROCESSING MESSAGES.

12. CHECK THE VALIDITY OF THE RELEASING OFFICER'S SIGNATURE ON EACH MESSAGE.

13. HANDLE EACH MESSAGE IN ACCORDANCE WITH THE PRECEDENCE ASSIGNED BY THE DRAFTER.

14. ASSIGN TO EACH MESSAGE A DATE-TIME GROUP.

15. LOG OUTGOING MESSAGES IN THE CENTRAL MESSAGE LOG.

16. DISTINGUISH BETWEEN VARIOUS TELECOMMUNICATION METHODS OF MESSAGE DELIVERY.

17. DETERMINE THE METHOD OF MESSAGE DELIVERY TO BE EMPLOYED AND THE FORMAT REQUIRED.

18. ENCODE/DECODE ADDRESS GROUPS.

19. ASSIGN CALL SIGNS, ADDRESS GROUPS, & ROUTING INDICATORS (AS REQUIRED).

20. IDENTIFY INCORRECT NAVAL ACTIVITY SHORT TITLES & CHANGE THEM TO CONFORM TO THE PLAD.

21. IDENTIFY ELEMENTS OF AUTODIN HEADERS.

22. PLACE MESSAGES IN AUTODIN FORMAT.

23. CORRECT FORMAT ERRORS IN MESSAGES FORMATTED IAW JANAP-128.

24. CONVERT MESSAGES IN AUTODIN FORMAT TO MODIFIED ACP-126 FORMAT.

25. PLACE RELAY INSTRUCTIONS ON MESSAGE HEADINGS.

26. CHECK EACH MESSAGE FOR PROPER CLASSIFICATION CRITERIA INCLUDING SECURITY WARNINGS IN FORMAT LINES 2 & 4.

27. VERIFY GEOGRAPHICAL LOCATIONS WHEN PROCESSING OUTGOING MESSAGES.

28. IDENTIFY CATEGORY OF PRECEDENCE.

29. COMPLY WITH HANDLING TIME OBJECTIVE FOR EACH PRECEDENCE CATEGORY.

30. VERIFY EXISTENCE OF CLASSIFICATION AND DOWNGRADING/DECLASSIFICATION MARKINGS.

31. VERIFY EXISTENCE OF STANDARD SUBJECT IDENTIFICATION CODE (SSIC).

32. SCREEN MESSAGE HEADINGS FOR MESSAGES ADDRESSED TO ADDRESSEES ON GUARDLIST.

33. RECORD TIME OF RECEIPT OF EACH MESSAGE ADDRESSED TO GUARDLIST.

34. ALERT PERSONNEL WHEN FLASH MESSAGE IS RECEIVED & PERFORM THE PRESCRIBED PROCESSING ACTIONS FOR FLASH TRAFFIC.

35. DETERMINE THE INCIDENCE OF RECEIPT OF DUPLICATES OF MESSAGES PREVIOUSLY RECEIVED.

36. RECORD THE ORIGINATOR AND DATE-TIME GROUP OF EACH MESSAGE RECEIVED.

37. USING AN INTERNAL ROUTING GUIDE, INDICATE THE INTERNAL ROUTING NECESSARY FOR EACH MESSAGE ADDRESSED TO GUARDLIST.

38. MAKE REPRODUCTION OF EACH MESSAGE ADDRESSED TO GUARDLIST IN SUFFICIENT QUANTITIES TO SATISFY THE INTERNAL ROUTING INDICATED.

39. MAKE INTERNAL DISTRIBUTION OF MESSAGES RECEIVED IN ACCORDANCE WITH THE INTERNAL ROUTING INDICATED.

40. IDENTIFY CALL SIGNS.

41. IDENTIFY BROADCAST MESSAGES.

42. MONITOR PAGE PRINTERS THAT ARE ELECTRICALLY CONNECTED INTO THE FLEET RADIOTELETYPE BROADCAST SUB-SYSTEM.

43. CHECK-OFF BROADCAST NUMBERS BY INDICATING THE CLASSIFICATION OF EACH MESSAGE PASSED ON THE BROADCAST.

44. DETERMINE THE INCIDENCE OF MISSING BROADCAST NUMBERS, BY CONTINUOUS NUMBER CONTINUITY CHECK.

45. RECEIVE MESSAGES VIA THE FLEET BROADCAST.

46. MAINTAIN BROADCAST FILES.

47. FILE ONE COPY OF ALL FIRST RUN TRAFFIC IN THE BROADCAST FILE IN BROADCAST NUMBER ORDER.

48. DELIVER ONE COPY OF ALL FIRST RUN TRAFFIC TO THE BROADCAST TRAFFIC CHECKER.

49. IDENTIFY SPECIAL CATEGORY MESSAGES.

50. IDENTIFY GENERAL MESSAGES & THEIR SERIAL NUMBERS.

51. IDENTIFY READDRESSED MESSAGES.

52. FILE TOP SECRET AND SPECIAL CATEGORY MESSAGES IN A CRYPTOCENTER FILE IN DATE-TIME GROUP ORDER, AND CONSTRUCT A FILLER FOR EACH MESSAGE FILED.

53. FILE GENERAL MESSAGE IN A GENERAL MESSAGE FILE, SEGREGATED BY GENERAL MESSAGE TITLES IN SERIAL NUMBER ORDER: CONSTRUCT A FILLER FOR EACH MESSAGE SO FILED.

54. PREPARE A FILLER FOR EACH READDRESSAL MESSAGE THAT IS PROCESSED.

55. FILE ALL MESSAGES (OTHER THAN TOP SECRET, SPECIAL CATEGORY, AND GENERAL MESSAGES) AND FILLERS IN THE COMMUNICATIONS CENTER FILE IN DATE-TIME GROUP ORDER.

56. CONDUCT ROUTINE DESTRUCTION OF CLASSIFIED MATERIAL.

57. CONDUCT EMERGENCY DESTRUCTION OF CLASSIFIED MATERIAL.

58. FILE MONITOR ROLLS, RADIO LOGS, & SEND/RECEIVE LOGS.

59. DETERMINE THE MEANING OF PROSIGNS.

60. DISTINGUISH BETWEEN PROSIGNS & OPERATING SIGNALS.

61. ENCODE/DECODE VOICE CALL SIGNS.

62. DISTINGUISH BETWEEN SHIP/SHIP & SHIP/SHORE TELETYPE CIRCUITS.

63. DISTINGUISH BETWEEN THE THREE MAJOR COMPONENTS OF A NAVCOMMSTA IN RELATION TO THEIR CONTACT WITH THE SHIPBOARD SHIP/SHORE OPERATOR.

64. ENCODE/DECODE OPERATING SIGNALS.

65. INITIATE AND ANSWER PRELIMINARY CALLS.

66. TRANSMIT MESSAGES IN AUTODIN AND MODIFIED ACP-126 FORMAT IN THE ORDER OF THE PRECEDENCE ASSIGNED.

67. PLACE TAPES IN BACKLOG BIN BY PRECEDENCE.

68. REQUEST, AND REPLY TO REQUESTS FOR REPETITIONS AND CORRECTIONS.

69. PROVIDE RECEIPT FOR TRANSMISSIONS AND MESSAGES, AFTER ENSURING THAT THEY ARE ERROR FREE.

70. LOG ALL TRANSMITTED AND RECEIVED MESSAGES IN THE SEND AND RECEIVE LOGS, RESPECTIVELY.

71. AFFIX A TRANSMISSION OR RECEIVE ENDORSEMENT TO EACH MESSAGE TRANSMITTED AND RECEIVED, RESPECTIVELY.

72. PERFORM PAPER, TAPE AND RIBBON CHANGES, AS NECESSARY.

73. LOG TIME ENTRIES IN RADIOTELEGRAPH. LOG EACH TRANSMISSION.

74. PERFORM THE RESCUE OF A PERSON IN CONTACT WITH A LIVE CIRCUIT.

75. PERFORM THE FOLLOWING FIRST AID PROCEDURES: MOUTH-TO-MOUTH RESUSCITATION, BACK-PRESSURE ARM-LIFT AND BACK-PRESSURE HIP-LIFT ARTIFICIAL RESPIRATION, TREATMENT FOR SHOCK, AND TREATMENT FOR BURNS.

76. OBSERVE SAFETY PRECAUTIONS WHEN WORKING WITH ELECTRONIC EQUIPMENT.

77. PERFORM THE NECESSARY SAFETY PROCEDURES FOR GOING ALOFT.

78. IDENTIFY NAVAL COMMUNICATION EQUIPMENT BY MEANS OF THE JOINT ELECTRONICS TYPE DESIGNATOR SYSTEM.

79. ADJUST THE OPERATING CONTROLS OF THE AN/WRC-1 TRANSCEIVER.

80. ADJUST THE OPERATING CONTROLS OF THE AN/URC-9 TRANSCEIVER.

81. ADJUST THE OPERATING CONTROLS OF THE AN/UCC-1 TELETYPE TERMINAL EQUIPMENT.

82. ADJUST THE OPERATING CONTROLS OF THE AN/SGC-1A TELETYPE TERMINAL EQUIPMENT.

83. ADJUST THE OPERATING CONTROLS OF THE AN/SRC-20.

84. ADJUST THE OPERATING CONTROLS OF THE R-1051 RECEIVER.

85. ADJUST THE FRONT PANEL CONTROLS OF THE AN/URT-23 TRANSMITTER.

86. ADJUST THE OPERATING CONTROLS OF THE AN/URA-17 TELETYPE CONVERTER.

87. ADJUST THE OPERATING CONTROLS OF THE AN/WRT-2 TRANSMITTER.

88. ACTIVATE UNCOVERED MF/HF VOICE SUB-SYSTEM (TYPE Y).

89. ACTIVATE UNCOVERED UHF VOICE SUB-SYSTEM (TYPE U).

90. ACTIVATE COVERED UHF/VHF VOICE SUB-SYSTEM (TYPE R).

91. ACTIVATE UHF ORESTES COVERED SIMPLEX SUB-SYSTEM (TYPE B).

92. ACTIVATE UHF ORESTES COVERED DUPLEX SUB-SYSTEM (TYPE C).

93. ACTIVATE MF/HF ORESTES COVERED SIMPLEX SUB-SYSTEM (TYPE D).

94. ACTIVATE MF/HF ORESTES COVERED DUPLEX SUB-SYSTEM (TYPE G).

95. ACTIVATE ORESTES COVERED SHIP-SHORE MULTIPLEX TERMINATION (TYPE P).

96. ACTIVATE COVERED FLEET MULTICHANNEL BROADCAST, RECEIVER (TYPE N).

97. DETERMINE THE EFFECTS OF THE IONOSPHERE ON SKIP DISTANCES AND SKIP ZONE, AND USE THE RESULTS OF THIS DETERMINATION AS AN AID IN ESTABLISHING A LONG DISTANCE COMMUNICATION PATH.

98. DETERMINE THE EFFECTS OF THE IONOSPHERE ON SKYWAVE PROPAGATION AND USE THE RESULTS OF THIS DETERMINATION AS AN AID IN ESTABLISHING A LONG DISTANCE COMMUNICATION PATH.

99. TUNE ANTENNAS TO ACHIEVE OPTIMUM TRANSMISSION.

100. OPERATE THE KWX-8 CONTROL UNIT ON CRYPTO EQUIPMENT.

101. CHECK SUB-SYSTEM OPERATION FOR INDICATIONS OF SUB-NORMAL PERFORMANCE.

102. ISOLATE THE INCIDENCE OF SUB-NORMAL PERFORMANCE TO IMPROPERLY ADJUSTED EQUIPMENT, MALFUNCTIONING EQUIPMENT, FAULTY PATCHES, OR FAULTY COMMUNICATION PATH.

103. RESTORE SYSTEMS TO NORMAL OPERATION BY CORRECTING THE PATCH, COMMUNICATION PATH SUBSTITUTION, OR BY READJUSTMENT OR REPLACEMENT OF IMPROPERLY ADJUSTED OR FAULTY EQUIPMENT.

104. LOCATE PMS ASSIGNMENT ON THE 3-M WEEKLY SCHEDULE.

105. LOCATE THE MAINTENANCE REQUIREMENT CARD (MRC) WHICH PERTAINS TO THE PMS ACTION ASSIGNED.

106. LOCATE THE SPECIFIC EQUIPMENT ON WHICH THE PMS ACTION IS TO BE PERFORMED.

107. PERFORM THE PMS ACTION CALLED FOR BY THE MRC.

108. PAINT ANTENNAS.

109. CLEAN ANTENNAS.

110. PERFORM RESISTANCE CHECKS ON ANTENNAS.

111. PERFORM VISUAL INSPECTION OF ANTENNAS.

112. OPERATE PAPER TAPE READER, CARD READER & SEND PORTION OF THE COMMON CONTROL UNIT OF THE AN/FYA-71(V) DSTE AUTODIN TERMINAL.

113. CONDUCT CONTINUITY CHECK OF THE MULTIPLE ADDRESS PROCESSING UNIT SYSTEM EVERY HOUR ON THE HALF HOUR.

114. RESPOND IN THE PRESCRIBED MANNER TO ANY ALARM CONDITION IN THE MULTIPLE ADDRESS PROCESSING UNIT SYSTEM.

115. OPERATE THE TT-329 (REPERFORATOR).

116. OPERATE THE TT-331 (TWO ROWS OF THREE REPERFORATORS).

117. MAINTAIN BROADCAST STATUS LOG.

118. INITIATE/RESPOND TO PRELIMINARY CALLS AS THE NET CONTROL STATION.

119. TRANSMIT CARD TRAFFIC.

120. CLOSE OUT SEND CHANNELS.

121. DELIVER ALL MESSAGE TAPES RECEIVED TO THE MULTIPLE ADDRESS PROCESSING UNIT SYSTEM OPERATOR.

122. USE THE INTERNATIONAL DISTRESS AND CALLING FREQUENCY AND OBSERVE THE SILENT PERIODS.

123. RESPOND TO DISTRESS, URGENCY, AND SAFETY SIGNALS, AND TO THE FIVE ENEMY CONTACT ALARM SIGNALS EMPLOYED BY MERCHANT VESSELS IN TIME OF WAR.

124. PROVIDE RECEIPT FOR, OR RELAY, IN INTERNATIONAL FORM, INTERCEPTED DISTRESS MESSAGES AND ENEMY CONTACT REPORTS, USED BY MERCHANT VESSELS IN TIME OF WAR.

125. PREPARE A MESSAGE FOR TRANSMISSION BY RADIOTELEGRAPH IN PLAINDRESS, ABBREVIATED PLAINDRESS, AND CODRESS FORM.

126. OPERATE A RADIOTELEGRAPH CIRCUIT USING MILITARY PROCEDURES AND EMPLOYING CALL SIGN ENCRYPTION AND AUTHENTICATION.

127. USE THE COUNTERMEASURES AVAILABLE TO REDUCE THE EFFECTS OF JAMMING AND HARMFUL INTERFERENCE.

128. RECORD THE REQUIRED INFORMATION NECESSARY FOR REPORTS WHEN CONDITIONS OF JAMMING OR HARMFUL INTERFERENCE ARE DETECTED.

129. ENCODE/DECODE INTERNATIONAL CASS SIGNS.

130. ENCODE/DECODE TASK ORGANIZATION CALL SIGNS.

131. GUARD AGAINST ANY INCIDENCE OF COMPROMISE OF CLASSIFIED MATERIAL OR ANY SECURITY VIOLATION.

132. EMPLOY PHYSICAL SECURITY MEASURES BY ADHERENCE TO THE ACCOUNTING, DISSEMINATION, & STOWAGE PROCEDURES PRESCRIBED FOR CLASSIFIED MATERIAL.

133. EMPLOY TRANSMISSION SECURITY MEASURES BY ADHERENCE TO PRESCRIBED TRANSMISSION PROCEDURES AND BY ALERTNESS TO AND REPORTING OF DEVIATIONS FROM THESE PROCEDURES.

134. PROJECT CRYPTOSECURITY BY THE PROPER USE OF CRYPTOGRAPHIC MATERIAL, CRYPTO SYSTEMS, AND RELATED CRYPTO MATERIAL.

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APPENDIX C

BASIC RATING SCALE FORM USED ON LONG AND SHORT QUESTIONNAIRES

Listed below is a duty and the tasks which it includes. Rate each task on the three scales by circling the appropriate number. If you have any specific comments about training for these tasks, please write them in the area below the question or, if more space is needed, on the back of this sheet.	FREQUENCY OF TASK	CRITICALITY OF TASK	PERFORMANCE OF TASK UPON ARRIVAL FROM SCHOOL
PAGE: EIGHTEEN N DUTY: PERFORM THE FOLLOWING SHORE STATION COMMUNICATION CENTER FUNCTIONS	1. Never performed. 2. Performed very infrequently. 3. Performed monthly. 4. Performed weekly. 5. Performed daily.	1. Very small importance 2. Small importance. 3. Moderate importance 4. High importance 5. Very high importance.	1. Could not perform. 2. Substantially inadequate 3. Somewhat inadequate. 4. Adequate 5. More than adequate.
112. OPERATE PAPER TAPE READER, CARD READER & SEND PORTION OF THE COMMON CONTROL UNIT OF THE AN/FYA-71(V) DSTE AUTODIN TERMINAL.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
113. CONDUCT CONTINUITY CHECK OF THE MULTIPLE ADDRESS PROCESSING UNIT SYSTEM EVERY HOUR ON THE HALF HOUR.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
114. RESPOND IN THE PRESCRIBED MANNER TO ANY ALARM CONDITION IN THE MULTIPLE ADDRESS PROCESSING UNIT SYSTEM.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
115. OPERATE THE TT-329 (REPERFORATOR).	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
116. OPERATE THE TT-331 (TWO ROWS OF THREE REPERFORATORS).	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
117. MAINTAIN BROADCAST STATUS LOG.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
118. INITIATE/RESPOND TO PRELIMINARY CALLS AS THE NET CONTROL STATION.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
119. TRANSMIT CARD TRAFFIC.	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

APPENDIX D

SEVEN OPEN-ENDED QUESTIONS USED ON SHORT QUESTIONNAIRES

ANSWER THE FOLLOWING QUESTIONS BY CIRCLING "YES" OR "NO"

1. Is there any part of your job that you cannot do because you were not taught how to do it in school?

   Yes

   No

2. Is there anything you have had to learn to do on the job that was not taught in school but should have been?

   Yes

   No

3. Is there anything that you received some training on in school, but not enough?

   Yes

   No

4. Did the school actually teach the wrong way to do any part or parts of your job?

   Yes

   No

5. Did you learn anything in school that does not help you in your job in any way?

   Yes

   No

6. Is there something that you do well on your job that does not require as much time or emphasis as it received in school?

Yes

No

7. Did the school teach you to do anything that you could have learned to do better or faster on the job?

Yes

No

8. Please return to those Questions 1 through 7 that are answered "Yes" and, if possible, give one or more specific examples to help the school identify and correct its problems. Please do this carefully and thoughtfully. You, as a graduate of the school working in the job you were trained for, are in an ideal position to identify the problems that are almost certain to exist in the school.

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APPENDIX E

TRAINEE COVER LETTER FOR ALL INSTRUMENTS

CHIEF OF NAVAL EDUCATION AND TRAINING
NAVAL AIR STATION
PENSACOLA, FLORIDA 32508

Code N-343
10 JUL 1974

From: Chief of Naval Education and Training
To: Recent Graduates of Radioman "A" School

Subj: Field Evaluation of Radioman "A" School Training

Encl: (1) Field Evaluation Materials

1. In order to improve performance of the school graduate in his assigned unit, information is required as to the adequacy and relevancy of your training.

2. As a recent graduate of the Radioman "A" School, you are in a unique position to provide information to the schools on whether or not the Radioman "A" School has adequately prepared you to perform your job. The enclosed forms were designed to aid you in this task.

3. Please follow instructions carefully and provide all of the information requested on these forms. Your assistance is appreciated and will surely enhance the efforts to improve the training of future Radicmen.

M. W. CAGLE

APPENDIX F

TRAINEE INSTRUCTIONS FOR LONG AND SHORT QUESTIONNAIRE

INSTRUCTIONS TO TRAINEE FOR COMPLETING THE RADIOMAN "A" SCHOOL FEEDBACK QUESTIONNAIRE

Tasks included in your training as a Radioman are listed in this booklet. Rate each particular task on each of the three scales to the right of the task. The "Frequency of Task" scale includes levels of (1) Never Performed, (2) Performed Very Infrequently, (3) Performed Monthly, (4) Performed Weekly, and (5) Performed Daily. Circle the number corresponding most closely to the frequency with which you perform the task. The second scale is "Criticality of the Task," and the levels are (1) Very Small Importance, (2) Small Importance, (3) Moderate Importance, (4) High Importance, and (5) Very High Importance. Knowing how to perform a task that you presently don't do, may still aid you in your job, so a task that you "Never Perform" may still have some importance. The final scale is "Performance of Task Upon Arrival from School." Levels are (1) Could Not Perform, (2) Substantially Inadequate, (3) Somewhat Inadequate, (4) Adequate, and (5) More than Adequate. If mess-cooking or other activities at your duty station delayed engagement in these tasks, rate your first performance of the task. If you never perform the task in your present assignment, estimate how well your training has prepared you to perform it.

When rating the "importance" of a task, you are expected to use your own judgment. There are no absolute rules to guide you and it is quite likely that other trainees or supervisors would rate tasks differently than you. The same considerations apply when rating your performance on a task upon arrival from school. Your evaluation of how well you are able to perform a task may be different than an evaluation made by your supervisor.

Please remember, our goal is to find out how well the Radioman School is preparing trainees to do their job. It is not to rate you as a trainee. In other words, if there are important tasks that you feel you could not adequately perform upon arrival from school, then it is apparent there is a shortcoming in training. We are interested in your independent ratings and request that you work alone when answering this questionnaire. Please be objective and accurate and return the completed questionnaire to us in the enclosed addressed envelope. All replies will be held in strictest confidence by the study team. Thank you for your help!

NOTE: Please be sure that you always check one of the levels in the "Frequency of Task" and "Performance of Task Upon Arrival" scales. Even though you might never have performed some of the tasks, you should be able to make an estimate about how well you could perform them if you were required to.

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APPENDIX G

TRAINEE BIOGRAPHICAL DATA SHEET

PLEASE FURNISH THE FOLLOWING INFORMATION

1. Name____________________ 2. Rank__________ 3. SSN____________________

4. Today's date____________________ 5. Present Duty Station____________________

6. How many months have you been at your present duty station?____________________

Date arrived______________ 7. Have you been assigned to duty within your job specialty?_______ If No, what is your assignment?____________________

8. Did Mess-Cooking or other activities at this duty station delay the beginning of work in your specialty?_________ If Yes, what activities?____________________ ____________________ How long was the delay?____________________

9. Did you attend International Morse Code School or any other school after Radioman "A" School?_______ If Yes, which school?____________________

10. Check the following statement that best describes how much the training you received at the Radioman "A" School is used in your present job.

________ VERY MUCH ________ MUCH ________ SOME ________ VERY LITTLE ________ NOT AT ALL

APPENDIX H

OPEN-ENDED QUESTION FOR LONG QUESTIONNAIRE AND CARD SORT INSTRUMENT

Although we have asked you to consider all of the Radioman training in "excruciating" detail, there is still much that you can do for us. We need to know things that Radiomen need to know on their jobs that presently are not taught in "A" School and which should be taught there. Please indicate any such areas that you feel should be included in "A" School training in the future. Every suggestion you make will be submitted to curriculum design personnel for evaluation and consideration.

APPENDIX I

CARD SORT "PLACEMAT" FOR TRAINEE

TASK IS NEVER PERFORMED AT THIS UNIT	COULD NOT PERFORM THIS TASK	SUBSTANTIALLY INADEQUATE PERFORMANCE
SOMEWHAT INADEQUATE PERFORMANCE	ADEQUATE PERFORMANCE	MORE THAN ADEQUATE PERFORMANCE

ENCLOSED IS A SET OF CARDS WITH THE TASKS INCLUDED IN THE TRAINING RECEIVED BY THE RADIOMAN YOU SUPERVISE. SORT EACH CARD INTO THE APPROPRIATE BOX DEPENDING UPON HOW WELL THE TASK WAS PERFORMED UPON ARRIVAL FROM SCHOOL. IF PERFORMANCE ON A TASK WAS SUBSTANTIALLY INADEQUATE, THERE IS VERY LIKELY A SHORT-COMING IN TRAINING FOR THAT TASK. IF YOU HAVE ANY SUGGESTIONS TO IMPROVE OR REDUCE THE COST OF TRAINING FOR ANY TASK, PLEASE WRITE IT ON THE TASK CARD ITSELF. WHEN FINISHED, PLACE THE APPROPRIATE LABEL AROUND EACH STACK AND RETURN THE MATERIALS IN THE SELF-ADDRESSED ENVELOPE

APPENDIX J

RECOMMENDED QUESTIONNAIRE FOR SUPERVISORS

SAMPLE LETTER TO SUPERVISOR

From: Curriculum Update Division ____________ School
To: Supervisor of Seaman ________________

Subj: Field Evaluation of ______________ School training

Encl: (1) Field Evaluation Materials

1. As an experienced person in your rating and a supervisor of a recent school graduate, you are in an ideal position to tell us whether our graduates are meeting job requirements at your unit. The enclosed materials make it possible for you to indicate whether too much or too little emphasis was given to any of the various tasks covered in school. On the final page of this questionnaire we request that you indicate job tasks that are not presently covered in school, but which should be covered in the future. Throughout your completion of these materials, we hope you will write down any thoughts you may have about training problems, recommendations for their solution, and any other aspects of school training.

2. Please return these materials in the enclosed envelope within two weeks, if possible. This information will aid us to provide better training of ____________________ in the future.

3. If you have recently completed field evaluation materials for ______________ School there is no need to complete these unless you have some additional recommendations. However, we would appreciate if you would pass these materials on to some other experienced ________________ who is familiar with the above person's work.

CHIEF PETTY OFFICER ________

PLEASE FURNISH THE FOLLOWING INFORMATION ABOUT YOURSELF AND THE RECENT RADIOMAN "A" SCHOOL GRADUATE WHOM YOU SUPERVISE

1. Your name______________________ 2. Rank___________ 3. Today's Date___________

4. Duty Station______________________ 5. Name of recent RM "A" School graduate________

_____________________________ 6. His rank____________ 7. How many months has he been assigned to his present duty station?__________ 8. Has he been assigned to duty within his job specialty?_______ If No, what is his assignment?______________________________

9. Did he attend International Morse Code School or any other school after completing Radioman "A" School?________ If Yes, which school?________________________________

10. Did mess-cooking or other activities at this duty station delay the beginning of his work in his specialty?_______ If Yes, what activities?_______________________________ How long was the delay?________________ 11. Check the following statement that best describes how much this man's RM "A" School training is utilized in his present job?

________ VERY MUCH ________ MUCH ________ SOME ________ VERY LITTLE ________ NOT AT ALL

INSTRUCTIONS TO SUPERVISOR FOR COMPLETING RATING SCALES

On the following pages tasks are listed which received at least some emphasis in school. Please rate each task on the two scales at the right of the task by circling the most appropriate number. On the "Frequency of Task" scale, select the category that corresponds most closely to the actual frequency with which this task is performed by the recent school graduate that you supervise in his present assignment.

On the "Adequacy of School Training for This Task" scale, select the most appropriate of the following categories:

1. Task requires much more emphasis in school.
2. Training less than adequate for task, increase emphasis.
3. Training adequate for task.
4. Training more than adequate for task, reduce emphasis.
5. Greatly reduce or eliminate training for this task.

(You may skip this "Adequacy" rating for a particular task if that task is never performed and you do not feel you can rate adequacy of training for it.)

In making this rating consider such things as the following:

- Problems he may have had performing this task when first required to do it;
- The amount of time that was required by you or by others at your unit to bring him "up-to-speed";

- Whether, for some reason, the task should have been learned on-the-job instead of in school; and
- Whether learning to perform this task in school does not help this man in his present job or will not help him in the foreseeable future.

Your experience in your rating makes you uniquely qualified to judge when job tasks need more or less school emphasis. Not only have you already considered the question of what is the proper balance between school training and training on the job, but you can also see the possible future value of training that has little immediate use. We look forward to seeing your ratings of training adequacy and will give them much consideration.

PAGE: ____________

Listed below are tasks which presently receive at least some emphasis in school. Please rate each task on the scales at the right by circling the most appropriate number. Please feel free to also include your reasons for your rating and/or any specific recommendations for training on this task. Your comments may be written in any available space on the front or back of this page or on a seperate sheet.	**FREQUENCY OF TASK** 1. Never performed.* 2. Seldom performed or only in emergencies. 3. Performed monthly. 4. Performed weekly. 5. Performed daily. *ADEQUACY scale may be skipped if task is never performed.	**ADEQUACY OF SCHOOL TRAINING FOR THIS TASK** 1. Task requires much more emphasis in school. 2. Training less than adequate for task, increase emphasis. 3. Training adequate for task. 4. Training more than adequate for task, reduce emphasis. 5. Greatly reduce or eliminate training for this task.
	1 2 3 4 5	1 2 3 4 5
	1 2 3 4 5	1 2 3 4 5
	1 2 3 4 5	1 2 3 4 5
	1 2 3 4 5	1 2 3 4 5
	1 2 3 4 5	1 2 3 4 5
	1 2 3 4 5	1 2 3 4 5
	1 2 3 4 5	1 2 3 4 5
	1 2 3 4 5	1 2 3 4 5

Although we have already asked you to consider existing school training in great detail, there is one more very important job you can do for us. We need to know what things presently are NOT taught in school but should be taught there. Consider things the trainee has had to learn on the job with much loss of time for both him and his supervisors. Also consider tasks he still cannot perform because he did not learn them in school and because it has not been possible to train him on the job. Please do this carefully and thoughtfully. As a supervisor of a recent school graduate, you are in a unique position to identify those things which are almost certain to be missing from school.

1. ______________________________

2. ______________________________

3. ______________________________

4. ______________________________

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APPENDIX K

RECOMMENDED QUESTIONNAIRE FOR TRAINEES

SAMPLE LETTER TO TRAINEE

From: Curriculum Update Division ____________________School
To: Seaman ______________________

Subj: Field Evaluation of ____________________________School Training

Encl: (1) Field Evaluation Materials

1. At one of your last classes in school the important task you can perform in the identification of training problems was discussed. At this time, we are asking you to aid us in this task since you have probably been on the job long enough to have developed a good understanding of your duties and the training needed to perform them.

2. The enclosed materials make it possible for you to indicate whether too much or too little emphasis was given to any of the various tasks covered in school. On the final page of this questionnaire we request that you indicate job tasks that are not presently covered in school, but which should be covered in the future. Throughout your completion of these materials we hope you will write down any thoughts you may have about training problems, recommendations for their solution, and any other aspects of school training.

3. Please return these materials in the enclosed envelope within two weeks, if possible. This information will aid us to provide better training of ______________________ in the future.

Chief Petty Officer _________________

PLEASE FURNISH THE FOLLOWING INFORMATION

1. Name______________________________ 2. Rank_________ 3. SSN_________________________

4. Today's date______________________ 5. Present Duty Station__________________________

6. How many months have you been at your present duty station?_________________________

Date arrived_________________ 7. Have you been assigned to duty within your job specialty?_______ If No, what is your assignment?____________________________________

8. Did Mess-Cooking or other activities at this duty station delay the beginning of work in your specialty?_________ If Yes, what activities?___________________________ ________________________________ How long was the delay?_________________________

9. Did you attend International Morse Code School or any other school after Radioman "A" School?_______ If Yes, which school?____

10. Check the following statement that best describes how much the training you received at the Radioman "A" School is used in your present job.

_________ VERY MUCH

_________ MUCH

_________ SOME

_________ VERY LITTLE

_________ NOT AT ALL

INSTRUCTIONS TO TRAINEE FOR COMPLETING RATING SCALES

On the following pages tasks are listed which received at least some emphasis in school. Please rate each task on the two scales at the right of the task by circling the most appropriate number. On the "Frequency of Task" scale, select the category that corresponds most closely to the actual frequency with which this task is performed by you in your present assignment.

On the "Adequacy of School Training for This Task" scale, select the most appropriate of the following categories:

1. Task requires much more emphasis in school.
2. Training less than adequate for task, increase emphasis.
3. Training adequate for task.
4. Training more than adequate for task, reduce emphasis.
5. Greatly reduce or eliminate training for this task.

(You may skip this "Adequacy" rating for a particular task if that task is never performed and you do not feel you can rate adequacy of training for it.)

In making this rating consider such things as the following:

- Problems you may have had performing this task when first required to do it;
- The amount of time that was required by your supervisor or others at your unit to bring you "up-to-speed" on the task;

- Whether, for some reason, the task should have been learned on-the-job instead of in school; and
- Whether learning to perform this task in school does not help you in your present job or will not help you in the foreseeable future.

Also consider that school training is expensive and must be used only for essential tasks. On the other hand, remember that operational units have many other functions to perform beside on-the-job training.

As you can see, the rating of training adequacy is not simple. We are asking you to do this since you hold two views of the world that are critical for judging the adequacy of training. One view is of school training as it exists for the student and the other view is of the requirements of your present job. These unique perspectives of yours make your careful ratings invaluable to us!

PAGE: ____________	FREQUENCY OF TASK	ADEQUACY OF SCHOOL TRAINING FOR THIS TASK
Listed below are tasks which presently receive at least some emphasis in school. Please rate each task on the scales at the right by circling the most appropriate number. Please feel free to also include your reasons for your rating and/or any specific recommendations for training on this task. Your comments may be written in any available space on the front or back of this page or on a seperate sheet.	1. Never performed.* 2. Seldom performed or only in emergencies. 3. Performed monthly. 4. Performed weekly. 5. Performed daily. *ADEQUACY scale may be skipped if task is never performed.	1. Task requires much more emphasis in school. 2. Training less than adequate for task, increase emphasis. 3. Training adequate for task. 4. Training more than adequate for task, reduce emphasis. 5. Greatly reduce or eliminate training for this task.
	1 2 3 4 5	1 2 3 4 5
	1 2 3 4 5	1 2 3 4 5
	1 2 3 4 5	1 2 3 4 5
	1 2 3 4 5	1 2 3 4 5
	1 2 3 4 5	1 2 3 4 5
	1 2 3 4 5	1 2 3 4 5
	1 2 3 4 5	1 2 3 4 5
	1 2 3 4 5	1 2 3 4 5

Although we have already asked you to consider existing school training in great detail, there is one more very important job you can do for us. We need to know what things presently are NOT taught in school but should be taught there. Consider things you have had to learn on the job with much loss of time for both you and your supervisors. Also consider tasks you still cannot perform because you did not learn them in school and because it has not been possible to train you on the job. Please do this carefully and thoughtfully. As a school graduate working in the job you were trained to do, you are in a unique position to identify those things which are almost certain to be missing from school.

1.

2.

3.

4.

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APPENDIX L

RECOMMENDED REMINDER LETTER

From: Curriculum Update Branch, ______________ School
To: Recent ______________ School Graduate

About one month ago you were mailed materials for evaluating the training at ______________ School. It is most important that we receive your completed questionnaire in order that we may use the data in our continuing program to make training of ______________ both relevant and effective.

If you did not receive the materials, please contact us and we will mail another set. If you did receive them, please complete and return them as soon as possible.

Sincerely,

Chief Petty Officer ____________

APPENDIX M

SAMPLE ITEM SUMMARY DATA SHEET

ITEM # 52 Use principles of sky wave propagation to establish a long distance communication path.

TRAINEE FREQUENCY OF TASK	TRAINEE ADEQUACY OF SCHOOL TRAINING FOR THIS TASK	SUPERVISOR FREQUENCY OF TASK	SUPERVISOR ADEQUACY OF SCHOOL TRAINING FOR THIS TASK
1. Never performed.* 2. Seldom performed or only in emergencies. 3. Performed monthly. 4. Performed weekly. 5. Performed daily. *ADEQUACY scale may be skipped if task is never performed.	1. Task requires much more emphasis in school 2. Training less than adequate for task, increase emphasis. 3. Training adequate for task. 4. Training more than adequate for task, reduce emphasis. 5. Greatly reduce or eliminate training for this task.	1. Never performed.* 2. Seldom performed or only in emergencies. 3. Performed monthly. 4. Performed weekly. 5. Performed daily. *ADEQUACY scale may be skipped if task is never performed.	1. Task requires much more emphasis in schoo 2. Training less than adequate for task, increase emphasis. 3. Training adequate for task. 4. Training more than adequate for task, reduce emphasis. 5. Greatly reduce or eliminate training for this task.
1 2 3 4 5	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

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